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MAP MANEUVERS

. . . AND . . .

TACTICAL RIDES

. . . BY . . .

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THIRD EDITION

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"The whole loft of the house from end to end makes one undivided chamber; here are set forth tables on which to model imaginary countries in putty or plaster, with tools and hardy pigments; a carpenter's bench; and a spared corner for photography, while at the far end a space is kept for playing soldiers. Two boxes contain the two armies or some five hundred horse and foot; two others the ammunition of each side, and a fifth the foot-rules and three colours of chalk, with which you lay down, or, after a day's play, refresh the outlines of the country; red or white for the two kinds of road (according as they are suitable or not for the passage of ordnance), and blue for the course of the obstructing rivers. Here I foresee that you may pass much happy time."

—"*The Ideal House*", *Robert Louis Stevenson.*

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PREFACE

The first three chapters of this work originated in a series of lectures given to the class in the Army Staff College in 1906–7; the fourth chapter consists chiefly of problems which have been used in the Army Service Schools; the fifth chapter is a revision of a lecture given in the Army Staff College in June, 1909.

The first edition was published in 1907 for use in the Infantry and Cavalry School (now School of the Line). Map maneuvers were to be introduced in that school for the first time; some printed matter on the subject was thought necessary for use in preliminary preparation, and there was then nothing available which would serve the purpose.

This matter was published in book form at the instance of Major D. H Boughton, General Staff, U. S. Army, who was then Senior Instructor, Department of Military Art, Army Service Schools. If the book is thought to have any value, it is attributed, in a great measure, to assistance and encouragement from his successor, Major John F. Morrison, General Staff, U. S. Army.

Fort Robinson, Nebraska,
June 17, 1910.

INTRODUCTION

The soldier, unlike other professional men, has no opportunity, ordinarily, to practice his profession. Modern wars are short and infrequent, but involve enormous cost in blood and material resources. The outbreak of war must find the soldier already familiar with his work. There will not be time enough after the outbreak of war for him to learn his duties before military operations begin; and the cost of permitting him to learn by experience derived from his own blunders, is too great to be considered.

A man can acquire familiarity with his work only by experience; theoretical instruction alone does not suffice. As wars have become more infrequent, the necessity of giving soldiers practical training in the operations of war in time of peace has increased. It was formerly supposed that a knowledge of the art of war could be gained only in war; but experience has shown that armies can be trained more effectively in peace than in war. Modern armies are composed of peace trained soldiers. The most efficient armies of the world are composed of men who have never engaged in war. The effectiveness of modern armies is judged by the efficiency of their field maneuvers.

"It has long been recognized that mere 'barrack yard drill' is not a sufficient preparation for war; and it is a mere statement of an axiom to say that troops should be assembled as often as may be practicable in large bodies and required to act under conditions assimilated as nearly as possible to those of campaign and battle. There are many things that cannot be

learned by the most intelligent and diligent student of books, which are readily acquired in practice on the field. The formulation of orders, the arrangements for marches, scouting and reconnaissance, and the deployment of forces for battle can be conducted in peace maneuvers almost exactly as they would be in the serious business of actual war." (Report of Maneuvers of 1903, by Colonel A. L. Wagner.)

In a field maneuver, troops are handled in accordance with the requirements of a military situation which is more or less imaginary. A state of war is assumed to exist; bodies of troops are placed in designated positions, and their commanders are given missions and information of the enemy and supporting troops which make the performance of military operations incumbent upon them. A single body of troops may be maneuvered against an enemy who is wholly imaginary or is only partially represented; or two bodies of troops may be maneuvered against each other.

But the time, troops and maneuver grounds necessary for field maneuvers cannot be obtained often enough to give officers all the practical experience they need, and additional expedients are employed to extend the amount and variety of this practice. Officers are sometimes designated to command imaginary bodies of troops with other officers as their staff officers or their subordinate commanders. The imaginary troops are then conducted over actual ground by means of such orders and messages as would be used if the troops were real, a record being kept of the supposed positions of the imaginary troops by means of pencil notes. Exercises of this kind are called staff rides or tactical rides; they may take a greater variety of forms than field maneuvers, for the reason that there are fewer actual conditions to hamper them.

When the use of actual ground is not practicable, on account of bad weather, lack of transportation, or

other causes, the ground may be supplanted by a map, and maneuvers may be conducted on the map in much the same way as field maneuvers and tactical rides. These exercises are called map maneuvers or war games. Map maneuvers do not constitute an art or science apart from the art of war. The maneuvers conducted by this method could be carried on in the field with troops if time, troops and ground were available. We merely substitute a map for the ground and blocks or pins for the troops; nor is any special knowledge—except of map reading—essential in order to conduct maneuvers on a map, which is not also essential in conducting field maneuvers.

It is apparent that by this means opportunities for practice in maneuvers may be greatly extended. Maneuvers with troops are restricted to certain seasons of the year; they give practice in forming decisions and issuing orders to a few officers only; and restrictions in regard to the ground and troops available often limit the number and value of the lessons which can be drawn from them. Map maneuvers, on the contrary, may be carried on at all seasons; may be extended and varied so as to give many officers opportunities to exercise command; present no difficulties in employing any number or kind of troops; and may be conducted on any ground of which we possess a suitable map.

On first taking up exercises of this kind, a doubt may exist in the minds of some as to whether the operations of war can be represented on a map with sufficient accuracy to enable military students to derive lessons of practical value from them. Representations of military operations on a map may be made more faithful in some respects than those conducted on actual ground with troops. We hesitate, in our field maneuvers, to require the men to undergo the fatigue and other hardships incident to war; and our maneuvers are usually conducted either on military reservations where normal conditions do not exist, or

on ground which we are not permitted to use as we would do in war. In map maneuvers, on the other hand, we dig trenches, blow up bridges, burn towns, march troops over private grounds, and require them to make the exertions, undergo the hardships, and suffer the losses that must be expected in war.

The effect of fire can be taken into account more accurately in map maneuvers than in field maneuvers. For instance, it may happen in a field maneuver that a battalion of infantry, advancing in column of squads, is fired on at 2500 yards by a battery which has learned the range, and the battalion continues to advance in this formation—not knowing that it has been fired on—and thus gains ground to the front too quickly. Such incongruities can be avoided in map maneuvers and a reasonable allowance can always be made for the effect of fire, because the director is better informed and has more perfect control of the exercise.

Field maneuvers with troops form an indispensable part of an officer's training; they cannot be entirely replaced by exercises without troops; but officers who have had the most experience in handling troops are most readily interested in map maneuvers and are able to derive the greatest benefits from them, while officers who have seen troops handled but little, find difficulty in conducting map maneuvers and even in participating in them as commanders.

Tactical rides do not impose so great a strain upon the imagination as map maneuvers and have the advantage of requiring a study of actual ground; but they are at the mercy of the weather and cannot be conducted so easily and rapidly as map maneuvers.

- Military Instruction
  - 1. Theoretical (study of military history and books on military subjects, lectures and discussions)
  - 2. Practical
    - 1. Service in War
    - 2. Drill, practice marches and target practice
    - 3. Military Operations in Imaginary Wars
      - 1. With Troops (Field Maneuvers)
      - 2. Without Troops
        - 1. On the Ground
          - 1. Terrain Exercise
          - 2. TACTICAL RIDES
          - 3. Staff Rides
        - 2. On a Map
          - 1. Map Problems
          - 2. TACTICAL MAP MANEUVERS
          - 3. Strategic Map Maneuvers

CHAPTER I

UTILITY, ORIGIN AND DEVELOPMENT

UTILITY

Every operation of war, from patrolling to the conflicts of great armies, can be represented on a map, and map maneuvers are of the greatest value to the practical military student:—

1. In supplementing field maneuvers and tactical rides, thus giving officers increased opportunities for practice in conducting maneuvers and in forming the decisions and in issuing the orders incident to the command of troops. They afford opportunities for continuing the practical training and instruction of officers during the winter season and in inclement weather. For this purpose exercises are conducted by a director or umpire, officers being designated to command opposing bodies of troops, in accordance with a pre-arranged situation, and in a manner similar to a field maneuver. In some cases one force only is represented, the enemy being outlined or imaginary.

2. Map maneuvers draw upon all sources of military knowledge. They promote theoretical study —compel, and even give zest to the study of the dryest details of military art. By using problems suggested by events of actual battles and campaigns, they arouse an interest in the study of military history, and impress upon the mind the lessons to be gained from it.

3. Map maneuvers are useful aids in devising tactical problems and in preparing solutions of them

by affording a means of analyzing military situations and testing the tactical measures suggested by them. One or two officers can "try out" a problem and a solution in this way by working continuously at the map, keeping all troops of both opposing forces represented, and dispensing with an umpire.

4. As a rapid method of conveying instruction in tactics, the instructor may propose problems and then solve them himself in the presence of students, the movements and positions of troops being represented on the map. The opinions of the students as to the measures which should be taken may be invited, and instruction may be given by means of a conversation in which all the students take part. This method is well exemplified in an article entitled "Une Manœuvre sur la Carte" in the March, 1907, number of the Revue Militaire Generale.

5. These methods of representing the movements of troops on a map are useful as an aid in the study of military history. They are used in the detailed studies of epochs of military history which are conducted in the Army Staff College. This method is exemplified by the "Studies of the Battles of Colombey-Nouilly and Gravelotte," by Sir Lonsdale Hale.

6. Map maneuvers also afford practice in map reading and in computations of the elements of time and space involved in military operations—practice of the greatest benefit to all officers.

7. Map maneuvers furnish an excellent means of familiarizing officers with military geography. It is a significant fact that most of the war game maps used by the Germans are of their frontiers—the ones most used being of the country bordering on France.

To the the Germans is due the credit of having originated map maneuvers and the German army has made greater use of them than any other. Their

Field Service Regulations say: "The war game, tactical problems, lectures, winter essays, and tactical rides all contribute to the mental training of officers. *The war game and tactical problems* awaken interest in the study of regulations, of tactics, and of military history, and afford opportunities for practice in forming decisions rapidly. In order to be beneficial, however, they must be conducted skillfully—by an officer specially fitted for it, selected without regard to length of service." (Par. 11, Introduction, F. D. O., 1900.) From the fact that the war game is here mentioned first among the factors of an officer's mental training, Meckel argues that it is regarded as the most important.

8. As a practical means of keeping the commanders of large bodies of troops informed of the military situation, and of the location of all parts of their commands, the methods of map maneuvers have a practical application in field maneuvers and in war. A hundred years ago Napoleon Bonaparte worked out the details of the concentration and deployment of his armies by maneuvering colored pins over a map of the theater of operations; and successful generals of the present day, notably the Japanese, are said to have used similar methods.

Some of the large business houses of this country keep in the office of the manager a large map of the United States on which are blocks bearing the names of their traveling agents, the blocks being moved daily to show the location of the agent; when the manager wishes to have business attended to in any part of the country, he has only to glance at the map to get the address of his nearest agent and can telegraph instructions to him without delay.*

All are familiar with the method by which train

*A system of state maps showing railroads, and colored tacks to show the location of traveling salesmen is sold by John W. Iliff, 171 E. Randolph Street, Chicago, Illinois.

dispatchers keep informed of the location of trains—a method which is said to be used by the Army Transport Service to show the location of transports.

The recent development in the efficiency of our signal corps indicates that in future a commander will be able to communicate with all parts of his army more directly and more promptly than has hitherto been thought possible. In order to derive the full benefit from this improved means of communication, the commander must keep himself constantly informed of the location of his troops. In the case of large forces this can be done only by representing troops on a map—by some such method as those used in map maneuvers.

9. The greatest benefit to be derived from map maneuvers lies in the training which officers receive in forming decisions promptly, in issuing orders, and in writing messages and reports. Young officers may obtain through map maneuvers instruction and practice of this kind which they would not get in any other way. "The power of rapidly grasping a situation, of being able quickly to come to a decision and at once issue clear and easily executed orders, more than the possession of any other faculty, brings success to a commander in the field. The development of this faculty ought to be the main objective of the training of combatant officers in peace." (Haig.)

To officers who have spent years in subordinate grades without opportunities for exercising independent command, map maneuvers may bring an increased interest in their profession and a higher respect for it by giving them opportunities to handle on a map the three arms combined in contact with an enemy.

Maneuvers should go hand in hand with theoretical military instruction. Purely theoretical instruction applies only to general cases—its rules and principles

are only indications, totally insufficient for special and exceptional cases. In maneuvers an officer has opportunities to apply principles which he has learned and test their value. Theoretical instruction in military art has but little value if the student cannot utilize it; and it is only by the practical application of such knowledge that he can gain facility in its use.

ORIGIN--WAR CHESS

The game of chess is the oldest form of war game, and modern map maneuvers have grown out of the game of chess by a long process of evolution.

In 1664, Christopher Weikhmann invented at Ulm a modification of the game of chess which he called "King's game". Each player was given 30 pieces, as follows: 1 king, 1 marshal, 1 colonel, 1 captain, 2 chancellors, 2 heralds, 2 chaplains, 2 knights, 2 couriers, 2 adjutants, 3 body guards, 3 halbardiers and 8 private soldiers. The pieces had fourteen different kinds of moves. The author stated that it was not designed to serve merely as a pastime but that it would furnish any one who studied it properly a compendium of the most useful military and political principles. This game was played for many years and was very popular among the German nobility.

In 1770, a similar game appeared at Prague, invented by Höchenberger, which lived through several editions, the last appearing in 1814.

In the latter part of the eighteenth century war was taught in Prussia as an exact science— a branch of applied mathematics resembling geometry. Von der Goltz says, "A true strategist of that epoch did not know how to lead a corporal's guard across a ditch without a table of logarithms" (page 287, Rosbach et Jena, V. der Goltz).

In 1780, Helwig, a master of pages at the court of Brunswick, invented a modification of the game

of chess for the purpose of illustrating the principles of war. The pages under his charge were young noblemen destined for military service, and the game was invented as a means of interesting and instructing them in military science. Helwig said of it in a letter written in 1781: "Numbers of military men, profound in the theoretical and practical science of their profession examined it; . . . they recognized in it a very efficacious means for attracting the attention of young men destined for military service, creating in them a taste for the service, and lessening the difficulties of instruction."

The game was played on a board divided into 1,666 small squares tinted in various colors to represent different kinds of ground, villages, lakes, etc. Troops were represented by pawns similar to those used in chess; all the pieces represented either battalions of infantry or squadrons of cavalry. They moved and fought according to fixed rules similar to those of chess. Squares in opposite corners of the board represented fortifications, and the object of the game was to capture the fortress of the adversary.

Helwig's game was a great success; it attracted favorable comments everywhere and was introduced into France, Austria and Italy. A number of imitations or variations of it appeared, among which may be specially noticed one invented in 1798 at Schleswig, by Georg Venturini, a writer on the science of war. Venturini's game was intended primarily for use in military schools and a revised edition of it appeared in 1804. Venturini was the first to break away from the chess board and make use of maps. The moves of the pieces were made to resemble the ordinary marches of troops, and the configuration of the ground was taken into account. In his edition of 1804 Venturini says: "One should not call this officers' exercise a *game*." Of it Von der Goltz says:

"It resembles very closely the game of '*poste et de voyage*', in vogue a few years ago, in which, upon making an unlucky throw of the dice, one tumbles into a swamp, or breaks an axletree, or experiences some other such mishap. . . . This war game is a bad product of the refined military education of the period, which had piled up so many difficulties that it was incapable of taking a step in advance."

Other inventors of war games during this stage of development were: Giacometti (1793), Rohrbek (1804), Opitz (1806), Hoverbek (1806), Von Glöden (1817 — this was a sort of checker game with 128 pieces on a side), Perhuhn (1818), Von Pilsach (1820—a fortress game) and Plannen, a lieutenant in the Austrian army (1822).

All of the war games of this period may be designated as war chess. They probably illustrated the science of war, as taught at that time, better than it could have been represented on a map or on the ground.

WAR GAME

The credit of originating the war game is commonly given to the Prussian War Counselor* von Reisswitz, a civilian, who in 1811 invented a game conducted on a terrain modeled in sand, troops being represented by blocks of wood. This game attracted the attention of the king (Frederick William III) and Von Reisswitz made for him an improved form of it, in which the terrain was modeled in relief in plaster, scale 1:2373—woods, villages, roads and water courses being shown with colors and the troop blocks made of porcelain. The king was greatly pleased with it and matches at this game were quite popular at his court.

The honor of originating the war game should, however, be given to Lieutenant von Reisswitz, of

*Kriegs und Domänenrat, war and state adviser.

the Artillery of the Prussian Guard, a son of the von Reisswitz previously mentioned. This officer conceived the idea of adapting the game devised by his father to the details of actual military operations, thus making practical utility to military men its primary object.

With the assistance of other officers, he framed an elaborate system of rules, which were published in 1824 in a work entitled "Instruction for the Representation of Tactical Maneuvers Under the Guise of a War Game". It was a great step forward in that the exercises were to be conducted on maps, and that any military situation could be represented.

This game was received with marked favor by the most distinguished Prussian officers. It is told that in 1824, Von Mueffling, then Chief of the General Staff, consented to witness an exhibition of the game. He received the players somewhat coldly, but as the operations expanded on the map, the old general's face lit up, and at last he broke out with enthusiasm: "It's not a *game* at all, it's a training for war; I shall recommend it most emphatically to the whole army."

He kept his word, and a letter written by him which appeared in the "Militar Wöchenblatt" in March, 1824, may be said to be the formal introduction of the war game to the Prussian army. Among other things he said: "Whoever understands the art of war can, in this game, perform the functions of a commander of troops . . . even if he . . . has never seen the game played. By practicing on good maps representing a real terrain, and changing them, it becomes the more instructive, because it permits a variation in the dispositions to be made and the orders to be given. I shall endeavor by all means at my disposal to increase the number of maps now existing." The king directed that each regiment be supplied

with one of these games and Lieutenant von Reisswitz was employed to superintend the preparation of the new maps. The maps which he used were on a scale of 1:8000 and were as complete in details as they could be made, but showed only four square miles of ground. The troops were represented by blocks cut to the scale of the map and painted, red for one party and blue for the other, and showing by conventional signs the strength and arm of service of the organizations represented. Only the troops supposed to be seen by the enemy were shown by blocks.

The exercises were begun by giving to the commanders general and special situations in writing, and requiring them to prepare written orders. It was carried on in "moves" of two minutes each, but when the opposing parties were not in contact the director could order several moves to be made at once.

It is apparent that this exercise had many excellent features and, no doubt, reflected the more rational views of the art of war which followed the Napoleonic era. Its weakness lay in its numerous and detailed rules, which demanded long preparation on the part of the director and confined the operations within narrow limits. All decisions were made with the aid of dice, from which it resulted that the most carefully planned combinations would fail if the dice did not favor them. The remarks of Von Reisswitz on this subject are worthy of note: "It is not a question of winning or losing as in cards or chess, . . . the approbation of one's comrades is the only possible reward. Whoever follows out his plan best, adopts the simplest and most natural means to the end, and departs least from the general idea of the operation, will have won the match, even though he may have lost more pieces than his adversary. . . .

The advantages they will derive from it will be to acquire skill in reading maps, in the selection of movements best suited to the different arms of the service, in the choice of positions, etc. The interesting discussions which are sure to follow a match will be of incontestable value in the study of the military art."

The war game retained in its main features the form given it by Von Reisswitz for half a century, and many of the changes made during that period were not improvements.

Von Reisswitz'* game did not escape hostile criticism. The objection most frequently made was that young officers would be so spoiled by allowing them to command brigades and divisions, even on a map, that they would lose their taste for company duty.

In spite of the interest with which it was at first received and the favor with which it was regarded in the highest military quarters, it did not soon attain the popularity which was expected. It was not in general use in the Prussian army until 1860, though it was kept up by clubs in some of the larger garrisons. The members of the Magdeburg Club (of which Von Moltke was manager), of the Berlin Club, and the officers of the artillery of the Prussian Guard are mentioned as being specially expert during this period.

In 1828, Von Moltke, then a lieutenant, was an industrious player, and later, when he became chief of staff of the 4th Corps in 1840, exerted his efforts to promote the game, which he considered the best means of imparting military instruction. When he became Chief of the General Staff in 1857 he took steps to extend it throughout the army.

* The attention which Von Reisswitz received excited the jealousy of other officers, and this resulted in his being transferred from the Guard and sent to a frontier fortress [Torgau]. Disheartened by this injustice, he committed suicide there in 1827.

The prominent defect of the game was the slowness and difficulty with which it was conducted, owing to the great number and complicated character of the rules and tables employed, which destroyed interest in the exercises. Not only did they render the game difficult, but there was a tendency to extend the application of general rules to cover particular cases, which often destroyed the value of the exercises. Several able works on the subject were published during this period—notably those of Decker and Witzleben and one published by the Berlin War Game Club in 1846. Rules relating to the estimation of the effects of fire were completed and assumed greater importance; the rules became more numerous and complicated and the practice of the game became more difficult.

The work of Von Tschischwitz which appeared in 1862 made some improvements in the way of less complicated rules and more practical methods of computing losses. The work of Von Trotha, which appeared in 1869, added a number of new rules and increased the difficulties.

No war game rules of this period give the data upon which they are founded, but there is reason to believe that the tables are almost purely theoretical and not based on the results of experience.

At the conclusion of the wars of 1866 and 1870-71, German officers qualified by experience to form opinions on such a question agreed that the war game as then conducted did not represent the varying circumstances of warfare in a satisfactory manner. The rules were already far too voluminous for convenient use, yet would demand great extension in order to obtain correct results.

Meckel says: "After the war, when military ideas ran into more practical channels, when a general desire for practice and training in troop leading

existed, and the war game was encouraged by imperial decree, it received a new, extraordinary, and universal enthusiasm—which, however, is not to be attributed to the old systems with their complicated rules, but which rather existed in spite of them. It is a question whether in the German army there was a war game played in strict conformity with the rules. The exercises, under the leadership of officers of high rank who had no liking for the old systems, cut loose more or less from the cast iron rules and assumed, under a free leading, the form of serious exercises in the leading of troops." (Anleitung zum Kriegsspiel, Meckel, revision of 1904.)

RIGID KRIEGSSPIEL

Efforts to eradicate the defects of the game took two different directions, and resulted in two varieties of the game, called "Rigid" and "Free," respectively. Those who followed the "Rigid" method studied and tabulated the results of experience—particularly from the records of the wars of 1866 and 1870-71. They endeavored to make the rules and tables accurate, and then to systematize them so that they could be more readily used.

Perhaps the best known of them is Captain Naumann, whose work entitled "Das Regimentskriegsspiel" appeared in 1877. His work contained some marked improvements in the mechanism of the game, but his system was still so complicated that few would have the patience to put it in practice. Captain Naumann originated the idea of selecting a standard case and deducing from it, by applying a suitable multiplier, the result to be expected in any particular case. An explanation of his method is to be found in our "Provisional Instructions for Maneuvers (1904—Par. 40).

The work of Colonel Livermore, U. S. Corps of Engineers, called "The American Kriegsspiel," is

based mainly on the system of Naumann, but it is a great extension of that system and in many respects an improvement upon it. Many more influences are taken into consideration by Colonel Livermore, and the game is thus rendered more flexible and a closer approximation to the conditions of war. Tables expressing the value of these influences are more logically and compactly arranged and a more rapid method of computation devised, in which logarithms are used to facilitate the numerous processes of multiplication required. Dice are used to fix the value of influences which are uncertain or concerning which no data can be obtained.

Colonel Livermore also devised an ingenious system of blocks, which not only represent troops to the scale of the map, but also show the condition of each unit in regard to fatigue and the losses which it has sustained—and thus obviate the necessity of keeping the cumbrous records which were formerly thought indispensable.

It may be confidently stated that Colonel Livermore's system is the best of its class; but it cannot be readily and intelligently used by any one who is not a mathematician, and it requires, in order to be able to use it readily, an amount of special instruction, study and practice about equivalent to that necessary to acquire a speaking knowledge of a foreign language.

MAP MANEUVERS

The evolution of modern map maneuvers from the old war game may be dated from the publication of three important works in Germany—through which a new system was continuously and progressively unfolded.

These were "War Game Studies", by Lieutenant Meckel, an instructor in the war school at Hanover,

published in 1873; "Instructions for the War Game," by the same author, published in 1875; and "A Contribution to the War Game," by Colonel von Verdy du Vernois, then Chief of Staff of the 1st Army Corps, published in 1876.

Meckel's "War Game Studies" consists in great part of a demonstration of the usefulness of the war game as a means of imparting military instruction; and is a spirited plea in its favor, pointing out the necessity for a change in the manner of conducting it.

His "Instructions for the War Game" emancipate the director from rules in conducting the exercise, but require him to consider the effect of fire—to be determined by the use of tables and dice. A revision of this work by Captain von Eynatten has appeared recently (1904) in which the tables of fire losses are omitted.

It was Meckel's intention to follow the "Instructions for the War Game" with a description of a concrete case, illustrating his view as to the manner in which an exercise should be conducted: but Von Verdy's "Contribution to the War Game" appeared shortly afterward, containing a description of a concrete case which met Meckel's view so fully that he gave it his unqualified approval and did not complete his own.

Von Verdy's work has been known in this country since 1897 through the translation by Major Eben Swift, U. S. Army, entitled "A Simplified War Game."* Von Verdy made a more radical departure from the old methods than Meckel had done. He abandoned entirely moves of set length and the use of tables and dice—leaving the conduct of the exercise and all decisions to the judgment of the director.

It is apparent that by this system great responsi-

*Published by Franklin Hudson Pub. Co., Kansas City, Mo.

bility is thrown upon the director, and the difficulty of obtaining sufficiently qualified directors has been urged as an objection to the system. Major C. W. Raymond, Corps of Engineers, U.S.A., says: "I think its inherent weakness is indicated in a sentence on the first page of Von Verdy's 'Contribution to Kriegsspiel'; a book written with the avowed purpose of advocating its employment. Having remarked that in spite of the general recognition of the utility of Kriegsspiel the attempt to carry it on is often abandoned, the writer says, in seeking a reason for this, that he has in most cases received the answer, 'There is no one here who understands how to conduct it rightly'. If this be true as regards the old Kriegsspiel with its tables and copious instructions, what must be the case when the director is thrown upon his own knowledge for guidance in his decisions. However possible such an exercise may be in Germany, it will certainly be found generally impracticable in our own country. In Berlin, where there are officers of the General Staff, who devote their undivided attention to the study of the art of war, it may be possible to obtain competent directors * * but in this country * * only in a few exceptional cases would it be possible to obtain a director, the superiority of whose experience and attainments would be so undoubted that his decisions would receive unhesitating acceptance. * * * My own experience as a director has convinced me that * * * the director, after he has conducted a few exercises, finds inevitably that he is acting in accordance with rules which he has consciously or unconsciously formed. Thus the choice we have to make is not between rules and no rules, but between rules based upon the careful study of all available data, which have stood the test of practice and the fire of criticism, and rules extemporized by a single authority,

to be accepted without demonstration, and to be varied by every new director." (Kriegsspiel, by Captain C. W. Raymond, C.E.)

Major Barth says of Free Kriegsspiel; "Where competent umpires can be obtained, this system will do passably well. But, to fill the position acceptably, the umpire should have had extensive experience in modern war and should have mastered its teachings so as to apply them in making his decisions. It at once becomes apparent that men whose dictum would be received without question are few in number in any country, and especially so in our own. * * * As it is admitted that fire action will be the leading factor in deciding encounters of every kind except cavalry charging * * *, every effort should be made to ascertain what the resulting losses will be." (Maneuvers and Kriegsspiel, Vol. XIII, Journal, M.S.I.)

The opinions of these able officers, based as they are on study and experience, compel respect. But Rigid Kriegsspiel has been found by the Germans, who have given it a thorough trial, to be too great a strain upon the patience; and we have less patience than the Germans. Efforts to introduce Rigid Kriegsspiel into our army have not been attended with success. Von Verdy's system has stood the test of practice for many years and is the only system in general use today. Recent publications on this subject by German, French, and British authorities follow Von Verdy in all essential particulars.

The officers of foreign armies derive both pleasure and profit from maneuvers on the map—conducted by this method; and, since a more general interest has been aroused in the study of military art by our garrison and service schools, it is believed that such exercises will prove interesting to our officers as well, and that less difficulty will now be found in obtaining competent directors. Difficulty

also exists in obtaining good umpires for our field maneuvers, but no one supposes that field maneuvers will be discontinued on that account, or that the methods of Rigid Kriegsspiel should be used in them.

We have many officers who are able to conduct field maneuvers in such a manner as to make them interesting and instructive to all concerned; and the same officers (if familiar with map reading) would make excellent directors in map maneuvers conducted by the Von Verdy method. Even if the director should make decisions, as to the effect of fire, etc., which appear erroneous, the exercise is not necessarily rendered unprofitable.

In Rigid Kriegsspiel the value of the undetermined factors is fixed in each particular case by throwing dice. Suppose that in an exercise at Free Kriegsspiel the director decides an attack to be repulsed when a more thorough examination of the conditions shows that it would probably succceed: the same decision might have been reached by the methods of Rigid Kriegsspiel if the dice did not favor the attack. The decisions of a director cannot be more erratic and unexpected than are the actual events of war.

Map maneuvers, as well as field maneuvers, should always be followed by a full discussion; by this means erroneous decisions will usually be detected and their evil effects eradicated.

In an essay (1906) on the subject of "Maneuvers and the Duties of Umpires," Colonel Livermore recommends that umpires at field maneuvers should use tables and computations similar to those to be found in his work, "The American Kriegsspiel"; and, indeed, it does appear that they are quite as necessary to field maneuvers as they are to map maneuvers. On this point Colonel Wagner's report of the field maneuvers of 1903 at West Point, Ky.,

and Fort Riley, Kas., says: "A table of losses was carefully prepared for the use of the umpires. Such tables, while very valuable in a game of kriegsspiel,* are of but little account in maneuvers in the field. * * * In most cases the action moves so quickly that the umpire is compelled to make his decisions instantly, without time for referring to a table, and the best that can be done is to endeavor to rectify any mistakes that may thus be made when the problem is finally discussed."

The objections here stated to precise computations of losses apply also to map maneuvers; for the delay caused by such computations would rob the maneuvers of their interest; and, since the time available for these exercises is always limited, would often prevent them from being carried far enough to be instructive.

Free and Rigid Kriegsspiel have tended to approach each other in recent years. In the last edition (1898) of Colonel Livermore's work, he says,—"It cannot be too strongly stated that * * * computations not only need not, but must not be made in every case. They are intended to facilitate and hasten the game, and should not be so perverted as to retard it. The reduction in the rate of march can almost always be estimated; only the important factors should be considered in modifying the effect of fire; unimportant fires should be neglected; the fatigue may be neglected until the players show a disposition to force the troops; * * * and the loss of ammunition need only be expressed when there appears to be difficulty about replenishing it." (p. 26, American Kriegsspiel).

Major Raymond says,—"We find the writers on Free Kriegsspiel occasionally admitting that rules and tables may sometimes be useful; and on the other hand, the advocates of Rigid Kriegsspiel generally be-

*The Kriegsspiel referred to here is, of course, *Rigid* Kriegsspiel.

gin with the statement that these rules and tables are intended to be merely of an advisory character and that the director should proceed without them whenever his personal knowledge suffices for the occasion. The distinction between the two systems is, indeed, largely one of degree; yet it is sufficiently marked to justify its recognition." (p. 3, Kriegsspiel).

Data in regard to the effect of fire, rates of march, etc., etc., are of great interest and value to all officers, especially to those who expect to act as umpires at maneuvers, but the practice of referring to such data during the progress of a maneuver—either in the field or on the map—has been universally discontinued.

MODERN GERMAN KRIEGSSPIEL

The Germans have maintained a leading place in the production of literature relating to the war game. The most notable modern German works on the subject—those which are of importance to the military student of the present day—are the following:

Taktische Aufgaben für Kriegsspiel, E. Zoellner, (1898);

Winke und Ratschlage für die Leitung des Regiments Kriegsspiel, Von Zimmerman (1901);

Das Regiments Kriegsspiel, Immanuel (1903);

Das Kriegsspiel, Anregungen, Erfahrungen und Beispiele, Anonymous (1903);

Taktische Aufgaben, Immanuel (1904);

Anleitung zum Kriegsspiel, Meckel, revised by Von Eynatten (1904);

Anlage und Leitung von Kriegsspielen, Oberlindober (1904);

Einführung in den Betrieb des Kriegsspiels, Von Litzmann (1905);

Das Kriegsspiel, Von Altrock (1908).

Only one of these works has been translated into English. A translation of Immanuel's Das Regi-

ments Kriegsspiel, by Lieutenant Krueger, U. S. Army, appeared in 1908 under the title of "The Regimental War Game", published by the Franklin Hudson Publishing Company, of Kansas City, Mo.

In the German army these exercises are carried on at the headquarters of each regiment and detached battalion under the name of the "regimental war game" (das regiments kriegsspiel); they are obligatory and one evening per week during the winter months is devoted to them. The regimental war game is conducted on maps of scales from 1:5000 to 1:8000 (12 to 8 inches to the mile) and includes maneuvers in minor tactics and the operations of detachments composed of all arms up to the strength of a brigade. The older officers of a regiment and the lesser staffs (corps and division) carry on tactical maneuvers called "Great Kriegsspiel" in which maps of a scale of 1:10,000 (6 inches to a mile) are ordinarily used and which include the operations of mixed brigades, divisions and larger forces. In addition a "strategical war game" is carried on by the General Staff, which is intended mainly for the instruction and training of staff officers;—for this, the general staff maps, scale 1:100,000 (about $\frac{2}{3}$ inches to 1 mile) are used.

INTRODUCTION IN OTHER ARMIES

After the war of 1866 the war game was cultivated extensively in Austria, and the war of 1870-71 opened the eyes of all Europe to its importance. In 1872 Captain Baring of the Royal Artillery prepared for the British service a set of rules based mainly on the work of Von Tschischwitz. In his preface Captain Baring says: "The increased importance which is now attached to the game may be, in some measure, due to the feeling that the great tactical skill displayed by the Prussian officers in the late war had

been, at least partially, acquired by means of the instruction which the game affords." The work of Captain Baring was used as a guide in this country for many years, notably at West Point where the game was played a great deal.

Captain Shaw conducted in England in 1877 a war game on a terrain modeled in relief in plaster on a large scale (1:720). The war game was officially introduced into the British army by the Duke of Cambridge in an order dated October 3, 1883. A pamphlet entitled "Rules for the Conduct of the War Game on a Map," was published officially to the British army in 1896. A later edition of these "Rules" was published in 1899. Rules for the conduct of the war game are now incorporated in the British Field Service Regulations (Combined Training). The war game is not made compulsory by orders from the War Office, but orders with reference to it, prescribing the character of the exercises and the frequency with which they are to be held, are issued by the commanders of military districts. War games involving the employment of large forces are conducted on maps whose scale is one inch to one mile; smaller exercises, involving only tactical questions, on maps six inches to one mile.

Since the whole of Great Britain has been mapped on both of these scales the problems may be laid in any part of the country. Each military district has its own war game maps, and exercises are often begun with large forces on the one inch scale map, arranging the problem so that hostile contact will take place within reach of the garrison. Details are then followed out either on the six inch maps as tactical war games or on the actual ground as tactical rides. War games are sometimes held for the purpose of illustrating certain phases of military history, and sometimes to familiarize officers with

certain tracts of country. The naval war game is used a great deal in England; it is conducted by excellent methods which have been originated by British naval officers.

The war game was first introduced in our army in 1867, shortly after the conclusion of the civil war. It was kept up voluntarily at a number of garrisons —notably at West Point. Interest in it was promoted by the organization of the Infantry and Cavalry School at Fort Leavenworth in 1881; exercises were carried on voluntarily there by officers on duty at the school. A knowledge of the game was extended by the publication of Colonel (then Major) Livermore's "American Kriegsspiel," which first appeared in 1883 and ran through several editions, the last appearing in 1898,

Upon the organization of the Army Staff College at Fort Leavenworth in 1904, the war game was made a part of the course of instruction in that College. It was made a part of the course of instruction in the Army School of the Line in 1907. It now forms an important part of the work of the Post Graduate Schools at a great number of army posts.

The war game has been kept up in the Austro-Hungarian army since 1866 and was made obligatory at an early date. Orders from the War Office direct that all officers and cadets of the Austro-Hungarian army receive instruction in the war game. This instruction is given from about the middle of November to about the 1st of March in each garrison, under the supervision of the senior officer present or of a specially selected officer. About three hours a week are devoted to this work.

In Italy, instructions, based mainly on the work of Von Trotha, were published by the General Staff in 1873, under the designation "Maneuvers on the Map" as they are officially called. Map maneuvering is a

part of the professional examinations for the grade of captain and field officer. Preparation is made for map maneuvers by instruction in map reading, calculation of the time required for different movements of troops, and by map problems. In the War College map maneuvers are held about forty evenings of the third (and last) years course. It is used as a means of instruction in logistics and in the work of General Staff officers. In the Great General Staff (corpo di stato maggiore) officers who are expected to act as intendents, commanders of bases, and to fill various staff positions in case of war are trained in the duties pertaining to these positions by applicatory map maneuvers. Tactical and staff rides and discussions on the terrain are frequently held.

Kriegsspiel was introduced in France in 1874 and for a time acquired a certain vogue in several army corps; at the garrison of Besançon two war games were kept up during the winter of 1874-5 and at Paris war games were frequently held. They were definitely taken up as a means of instruction at the French War College in 1889. Ministerial instructions relating to map maneuvers (Exercices sur la Carte) were issued February 20, 1895, but did not make them obligatory except in the staffs. Major Ch. Henrionnet, writing in 1898, says that after a few years of half-hearted and isolated efforts the war game had fallen into disuse in the line of the army and was then scarcely known in France outside the War College and the staffs. Map maneuvers were made obligatory in regiments and garrisons in April, 1900, and improved methods of conducting them, developed by experience at the War College, have been extended throughout the army.

Early efforts to conduct map maneuvers in France were hampered by a lack of suitable maps. The maneuvers were conducted, until recently, on the état-

major map, scale 1:80,000, which does not show the configuration of the ground in sufficient detail to permit the movements and formations of troops to be accurately considered. In 1905, a map was specially prepared for map maneuvers, called the "Commercy-Metz" map; its scale is 1:10,000 and it is merely an eight-fold enlargement of a portion of the état-major map.

In Russia, war games form part of the course of instruction of officers during the winter months. By War Department Orders No. 28 of 1875 and No. 71 of 1876 the systematic instruction of officers was to be taken up by means of written exercises and lectures on tactics under the direction of regimental and battalion commanders. War games were to be held in conjunction with this instruction whenever sufficient time, rooms and other facilities were available. When commanding officers required assistance in conducting war games, general staff officers from the staffs of divisions, corps, and military districts were to be sent to them for this purpose. By means of war games officers were to be taught map reading, tactical formations, the attack and defense of positions, the quartering, protection and marching of troops. War Department Orders No. 259 of 1882 and No. 62 of 1903 relate to the same subject. In 1903 a war game map, scale 1:8400, was made by General Scheweljew. In the large garrisons and at the headquarters of general officers, great war games or fortress war games are conducted by the older officers each year. At St. Petersburg, naval war games are held. A scarcity of good directors has been noted and consequently, since 1903, in addition to general officers and general staff officers, line officers have been trained to perform this duty; but not more than fifteen evenings in a winter are devoted to war games. War games are also used for the purpose of testing

the fitness of officers for promotion. The results attained have not been all that was desired, and it is stated in War Department Orders No. 85 of 1903 that the causes of this failure are:—the inability of the directors to arouse interest in the games; too much adherance to fixed models; a scarcity of good directors; a lack of interest on the part of the higher commanders; and insufficient familiarity of the participants with the tactical handling of the three arms.

The Russians are now trying hard to remedy these defects, and, since the war in Manchuria, the higher officers have taken greater interest in the war game.

In Turkey war games are prescribed by Par. 11 of their Field Service Regulations, but are actually held in only a few garrisons where they are directed by officers educated in Germany.

The war game was introduced in the Japanese army by General Meckel. Japanese translations of the works of Meckel and Von Verdy are used by the Japanese officers. Great stress is laid on the value of the war game as a means of instructing officers throughout the Japanese army—especially in the Japanese War College.

NAVAL WAR GAME

The naval war game antedates the war game for land forces by many years. The theater of operations in a naval battle may be regarded as a plane surface and may be represented by a black board or a sheet of paper. The tactical naval game was consequently not hampered in its development in the same way as was the tactical game for land forces, which did not attain real value until maps were produced which showed the configuration of the ground.

In the strategical naval game, maps are used which are of smaller scale than can be profitably used

for land forces; this greatly extends the area that can be considered, and operations in widely separated parts of the world are sometimes handled in the same game.

In the development of the naval game British authorities have taken the lead, as was to be expected of a people possessing the greatest navy in the world. The naval war game was introduced in this country in 1886, and is now an important part of the work of our Naval War College.

RECENT DEVELOPMENTS

Von Verdy's system aroused a great deal of opposition at the outset, but it has steadily gained ground until it has replaced all others. The general features of his system have not changed, but map maneuvers have undergone more rapid development as a military exercise in the last twenty years than in any other period of equal length in their history.

It came to be realized that the old war game maps, which were maps of battle fields—intended to illustrate certain situations—did not give sufficient scope for maneuvers; and that "ideal" maps produced one-sided situations and gave an air of unreality to the exercises. As a result, maps have been made specially for map maneuvers, which have added greatly to their value. These are topographical maps of tracts of real ground made on suitable scales, large enough to give freedom of action to the troops represented, and of sufficiently varied ground to illustrate any situation or operation of war.

Tactical rides, as conducted in the German army, have had an important influence upon the conduct of the war game. Von Verdy attributes the origin of his method of conducting the war game (Free Kriegsspiel) to his experience in tactical rides. These are exercises in which officers carry on the operations of

imaginary bodies of troops over actual ground, writing the orders and messages that would be required if the troops were real. Since dice, moves of fixed length, formal rules and tables were not used in these exercises and troops were not represented, it became apparent that dice, etc, were not necessary in map maneuvers, which are similar exercises conducted on a map; and that blocks, while useful in illustrating situations, were not indispensable.

Thus while greater importance is attached to the excellence and variety of the maps used, less importance is attached to the other accessories of the game, —blocks, dice, tables, rules, etc.

In tactical exercises the ponderous three-map game has nearly disappeared and now, as a rule, but one large-scale map is used by all the participants. In addition each of the participants is usually provided with such small scale maps of the theater of operations as they would be likely to be provided with in war; and, as a rule, are permitted to see the large scale map (which takes the place of the ground) only while situations are being explained and while they are issuing orders. Commanders are not, as a rule, permitted to move the blocks representing their troops, and the "move" (zug) of uniform length has been abandoned. Tables and fixed rules, as part of the mechanism of the exercises, have entirely disappeared. Dice are still used by some of the older officers in Germany but are losing ground. The presentation of military situations, the formation of military decisions, and the issue of military orders are the predominant features of the exercises.

More attention has been given to the selection of problems with a view to systematic and progressive instruction, and the exercises have become in reality what Von Mueffling divined in 1824—a serious means of preparation for war.

THE GAME FEATURE

Although map maneuvers owe their origin to a game, the game feature is no longer an important element of them. A predominance of the game idea has always been an obstacle to the proper development of these exercises as a means of military instruction and training. Through the influence of the game idea, the exercises have often been carried farther than was necessary or profitable. In order to ascertain which of two parties of players would be the winners it was necessary to push an engagement through to a decision; and in order that no injustice might be done to either side, computations of losses were made, and accurate records kept by a definite and uniform system. The dice, tables and rules served to secure fairness to the players and to clear the director of suspicion of bias; but when the idea that the map maneuver is a sort of game—in which one merely plays to win—is set aside these considerations lose their importance.

The game idea manifests itself at field maneuvers as well as in those conducted on the map. At the conclusion of a field maneuver those interested are heard to ask, "Who won, the Blues or the Browns?" and it seems to be a general impression that the principal function of the umpire is to award the palm of victory to one side or the other.

The questions which we should keep uppermost in maneuvers are,—What principles of the art of war are illustrated? Have the troops been handled to the best advantage? What other dispositions might have been made? The question as to which side has the advantage at the close of the maneuver is relatively unimportant, and may be due to unforeseen circumstances. Maneuvers do not always result in a combat and it is often possible for both parties to execute their missions successfully. The

movements of troops prior to the establishment of contact and those made during the early stages of an engagement are often more instructive than the subsequent course of the maneuver.

If it is desired to continue a field exercise after close contact has been established, a decision must usually be made as to the conduct of the troops—as, for instance, that one party or the other must retire, that one or both cannot advance until reinforced, etc.; but an estimate of the probable losses is useful only as a guide in rendering such a decision. After close contact has been established, however, a field maneuver generally loses resemblance to an operation of war and ceases to be instructive. This is not true of map maneuvers to the same degree, for the reason, as previously stated, that the director has the exercise under better control and is better able to determine the probable effect of fire. But the time which can be devoted to a single maneuver on a map is limited and does not often permit the maneuver to be carried through to the total defeat of one of the parties. In order to give a needful variety of instruction, too great a proportion of the available time should not be devoted to the consideration of the closing stages of battles.

A few hundred years ago battles were fought by common consent of both armies, and the art of war was limited to the battle field. But at the present day the most important movements of troops generally take place out of sight of the enemy, and these we can feel sure of representing faithfully on a map; but we cannot feel so sure of representing correctly the latter stages of a combat, for no one can tell with certainty the manner in which future battles will be fought.

THE TITLE

The idea that a map maneuver is a kind of game has always been harmful to this class of military ex-

ercises. As already pointed out it leads to a multiplicity of technical rules which obscure the real purpose. The term "war game" probably has something to do with this misconception and has led many to believe that it is a form of amusement.

The originator of the war game (Von Reisswitz) disliked the name and realized its unsuitability. It had been applied to the "war chess" games which existed before his time, and he retained it only because he could not at that time find one more suitable. The designation "map maneuvers," used in France and Italy, describes more aptly the nature and aim of these exercises.

It has been hoped by some enthusiasts that map maneuvers would prove so attractive and entertaining that they would gain a footing as a popular form of amusement among our officers;* but in the forty years which have elapsed since their introduction into our army, it does not appear that any notable progress has been made in that direction. The armies which derive any considerable benefit from them regard them as a military duty.

*Meckel entertained this opinion in regard to German officers. In his "Instructions for the War Game" (1875) he says: "It is recommended that the practice of the war game be not made compulsory. A sense of duty will impel the superior officers to take up the game with enthusiasm, and the practice of the game will extend on account of the pleasure they find in it."

CHAPTER II

MAPS AND MATERIAL

CLASSIFICATION

The most important accessory of a map maneuver is the map: upon it the character and success of the maneuver, in a great measure, depend.

The map is to the map maneuver what the ground is to the field maneuver, and, to some extent, the same considerations apply to both. For instance, Meckel says: "The most instructive situations are to be found on maps showing a varied terrain with numerous hills, villages, farms and small woods. A map showing nothing but a level piece of country, or forest only, or merely rough high hills, is unsuitable. A map which embraces a large tract of country naturally offers variety," etc. (Anleitung zum Kriegsspiel, 1904.)

The development of map maneuvers in the past twenty years has been marked chiefly by the improvement in the maps used. The maps formerly used were maps of battlefields—prepared for historical purposes. They were only large enough to show certain phases of the battle and were too limited in extent for maneuvers. "Ideal" maps showing imaginary tracts of ground were also formerly used.* The new maps are prepared especially for map maneuvers and show large tracts of actual ground; they have entirely supplanted the old maps in all European

*Meckel's early works were accompanied by an "ideal" map; the map which accompanied Col. Livermore's "American Kriegspiel" was of the same kind.

armies. The new maneuver maps are free from the checker board squares with which the old maps were covered, and seem to have lost nothing of value by discarding them.

As the value of the maneuver is dependent upon the excellence of the map, the character of the maneuver is controlled by its scale. The most natural classification of map maneuvers therefore is that based upon the map used. Meckel divides map maneuvers into three classes:

1. The regimental war game, embracing maneuvers in minor tactics and tactical exercises from the conduct of patrols to the operations of detachments of all arms less in size than a division; for these he considers maps of scales from 1:5000 to 1:6250 (12 to 10 inches to one mile) the most suitable. The name "regimental" is due to the fact that exercises of this character are carried on at the headquarters of each regiment (and detached battalion) in the German army.

2. The great war game—devoted chiefly to the operations of divisions. As the division is the smallest independent unit—complete in all arms and administrative staff — its operations, transportation, supply, etc., may embrace a wide range of military problems. For the great war game he considers maps of a 1:10,000 scale (about 6 inches to 1 mile) most suitable. These maneuvers are carried on by the older officers in each regiment and by the lesser staffs (corps and division).

3. The strategic war game embraces the operations of armies, and is conducted on the General Staff maps, scale 1:100,000 (about $\frac{2}{3}$ inch to 1 mile) by the General Staff at Berlin. This exercise is intended chiefly for the instruction and training of general staff officers. Battles are not carried into details,

but are considered incidentally—chiefly with a view to their results.

No systematic division of map maneuvers has been made in our army, but the following seems to be suitable:

1. Maneuvers in Minor Tactics—embracing tactical exercises from patrolling to the operations of small detachments of all arms, for use at army posts and the Army School of the Line—maps on a scale of twelve inches to a mile, with contours at a vertical interval of five feet.

2. Maneuvers in Grand Tactics—embracing the employment of large detachments of all arms and of divisions, for the older officers at the larger posts and for the Army Staff College—maps on a scale of six inches to a mile, with contours at a vertical interval of ten feet.

3. Strategic maneuvers—embracing the operations of armies, for the Army War College—maps of the U. S. Geological Survey, scale 1:62,500 (about one inch to 1 mile).

In general, the more minutely we wish to consider the details of military operations the larger should be the scale of the map; but it is believed that the foregoing arrangement would meet our needs without unnecessary multiplication of scales.

In maneuvers in minor tactics it is often desirable to represent the fronts of units in line and their depth in column by blocks, pieces of cardboard, etc., cut to correspond to the scale of the map used, in order to indicate accurately the space covered by them. This can not be conveniently done in the case of small units when the scale of the map is less than twelve inches to a mile.

On maps whose scale is twelve inches to a mile the smallest units may be represented—down to the individual soldier; contours may be drawn at a verti-

cal interval of five feet without unduly crowding the map, thus permitting nearly all folds of the ground which are of tactical importance to be shown; and nearly all natural and artificial features of tactical importance can be shown to scale, thus avoiding much of the distortion of conventional signs.

Maneuver maps should be original, that is, drawn directly from the ground and not merely enlargements of smaller scale maps; for the process of enlargement multiplies errors, adds nothing to the information which the map contains, and leaves the map scant of needful information which the scale permits.

Maneuver maps should not be too small. In using a small map it sometimes happens that when one force has taken up a position the other cannot appear on the map without creating abnormal situations such as opposing batteries taking first positions within 1000 yards of each other, or a force gaining an abnormally strong defensive position by merely resting a flank on the edge of the map. Small maps offer little choice of measures in forming decisions, and give but little freedom of movement.

The continuous use of the same map is objectionable, as it leads to an abnormal familiarity with distances, features of tactical importance, etc., and makes it difficult to provide that variety in the exercises which is necessary to sustain interest. Besides, any one map is likely to favor unduly a particular arm and to lead to conclusions which may be correct in some instances but which are not of general application.*

AMERICAN MAPS

The oldest maneuver map of American ground—made especially for map maneuvers—is a map of the

*See p. 157, "Duties of the General Staff", Von Schellendorf, 4th edition (1905), British translation.

vicinity of Fort Leavenworth, Kansas, compiled in 1906 from surveys made by student officers of the Army Staff College. It embraces a tract about four miles in width and six miles in length; the scale is 12 inches to one mile and the contour interval is ten feet. It shows a diversified terrain and can be used for a variety of tactical exercises. Copies can be obtained by application to the Secretary of the Army Service Schools. A charge of 80 cents for the map unmounted, or $1.75 mounted on muslin is made to cover the cost of materials. Printed reproductions of this map reduced to a scale of four inches to one mile may also be obtained from the Secretary of the Army Service Schools. A two inch scale map showing a tract about eighteen miles long and twelve miles wide in the vicinity of Fort Leavenworth can also be obtained from him and is suitable for use as a guide map.

The "Oskaloosa" and "Kansas City" sheets of the Geological Survey map of Kansas, scale 1:125,000, are also available for use in connection with the "Fort Leavenworth" maneuver map; but a larger scale map (about one inch to the mile) of the country within ten miles of Fort Leavenworth is now being prepared by the U. S. Geological Survey. It is the intention of the Department of Military Art of the Army Service Schools to have this map reproduced on a scale of twelve inches to the mile and made complete in all essential details for use in map maneuvers.

Twenty sheets of this map, showing ground east of the Missouri river, have been completed and can be obtained from the Secretary, Army Service Schools. It is expected that thirty-six more sheets will be completed during the present year. Each sheet is eighteen inches square and covers a tract one and a half miles square. The map is sold for 5

cents a sheet unmounted, 9 cents a sheet mounted on muslin, and 13 cents a sheet mounted on card board.

A still larger and in many respects preferable maneuver map, scale twelve inches to one mile, is being made at the Army Service Schools. This is a map of the country in the vicinity of Gettysburg, Pennsylvania; twenty sheets of it have been completed and it is expected that sixty more will be completed during the present year. It is proposed to extend this map southward into Maryland. It will cover a diversified tract of typical American terrain, comprising a gently rolling agricultural region, hilly country, and a chain of mountains with numerous forests; it will provide our army with a maneuver map of our own terrain superior to any that we now possess; will enable us to represent almost every kind of warfare, and will, moreover, provide facilities for the detailed study of the history of the Antietam and Gettysburg campaigns of 1862 and 1863.

A photographic reduction of this map, scale three inches to one mile, is also being made. This will be very useful in framing problems for the larger map and in following the movements of bodies of troops which are widely separated or cover large areas.

The most suitable guide map for use with this maneuver map is the U. S. Geological Survey map, scale 1:62,500; the "Gettysburg" and "Fairfield" sheets of which have been recently completed.

It will be observed that, instead of making a large number of small maneuver maps, two large ones are being made. This course will provide maps which will give freedom of action to commanders, and will enable us to represent large armies or widely dispersed forces, while, for small forces, a variety of terrain may be secured by using different portions of the map.

A large scale map (about thirteen inches to one mile) has been made of the country in the vicinity of Washington by the Coast and Geodetic Survey, which may be used in map maneuvers. All features of the ground are shown in great detail; the contour interval is five feet. Fifty-eight sheets of this map, each representing one square mile of ground, have been completed. The map can be purchased from the Superintendent, U. S. Coast and Geodetic Survey, at a price of 10 cents per sheet. A special map of the vicinity of Washington, scale 1:62,500, made by the U. S. Geological Survey, could be conveniently used with it as a guide map.

A map of the Chickamauga National Park, prepared by the Park Commission in 1896–1901, scale eight inches to one mile, contour interval ten feet, shows in great detail a tract about three miles wide and four miles long. It has been used as a maneuver map, though its size restricts its use to problems in minor tactics, and the fact that the greater part of the park is covered by forest limits its value. Copies can be obtained from Julius Bien & Co., 140 Sixth Avenue, New York. The "Ringgold" sheet of the Geological Survey map of Georgia, scale 1:125,000, can be used with it as a guide map.

A detailed topographical map of the battlefield of Gettysburg, showing a tract about five miles square, was made in 1867 under the supervision of Major General G. K. Warren. The original map is in four sheets, drawn on a scale of 200 feet to one inch (over twenty-six inches to a mile) and the contour interval is four feet. It was reproduced in 1883 on a scale of 1:12,000 (5.3 inches to the mile), but the value of the reproduction as a maneuver map is greatly reduced by its being crowded with representations of troops at different phases of the battle. Copies of the reproduction can be obtained from the Chief of Engi-

neers, U. S. Army. The original map has been recently reproduced by the Military Information Division of the General Staff for the use of the Army School of the Line on a scale of twelve inches to one mile, conveniently divided into twenty-five sections; it shows a diversified tract of typical American ground in great detail and is well adapted to a variety of exercises.

Maps of the battlefields of Gettysburg, Antietam, and Shiloh—prepared by Battlefield Commissions—and the map of the Chickamauga National Park have been reproduced by the 2d (Military Information) Division of the General Staff on a scale of twelve inches to one mile for use in map maneuvers. This Gettysburg map is somewhat longer (north and south) than the one made by General Warren, but it is about a half mile narrower (east and west) and the contours are at an interval of twelve feet. The value of the Shiloh map is reduced by the heavy forest which practically covers the whole tract shown by it. The Antietam map shows an open country covered with cultivated farms (Sharpsburg and vicinity), but its extent is only 3 by $4\frac{1}{2}$ miles and parts of this area are not shown in detail.

No suitable guide maps for the Antietam or Shiloh maps are obtainable.

Other American maneuver maps are as follows: the map of the maneuver ground at West Point, Ky., made in 1903, scale $2\frac{3}{4}$ inches to a mile; of the Manassas maneuver ground, made in 1904, scale 3 inches to 1 mile; of the vicinity of Fort Riley, Kansas, prepared in 1903, scale 3 inches to 1 mile; of the maneuver ground near Austin, Texas, scale 3 inches to a mile; of the Mt. Gretna, Penn., maneuver ground, scale 4 inches to 1 mile; the map of the American Lake, Washington, maneuver ground, scale 3 inches to 1 mile; Atascadero, California, $3\frac{1}{4}$ inches to 1 mile;

Fort Benjamin Harrison, Indiana, 8.08 inches to 1 mile; and the Crow Creek Forest Reserve near Fort D. A. Russell, Wyoming, 3 inches to 1 mile. The Mt. Gretna map is quite small and only a part of the ground is shown in detail. The greater part of the Austin map shows forest destitute of roads.

A variety of interesting maneuvers can, however, be conducted on these maps; though, on account of the smallness of the scale, troops cannot be represented to scale and minor details cannot be worked out.

It would be desirable to prepare at every military post a topographical map of the ground on which field maneuvers are usually conducted by the garrison —drawn on a scale of 12 inches to a mile and with contours at 5 foot intervals. The preparation of the map, if distributed among the officers of the garrison, would serve to prepare them for map maneuvers by giving them the best sort of training for map reading; and the map would be useful in devising and testing tactical problems, in reviewing and discussing field maneuvers, and for use in map maneuvers.

Maps of tracts of ground which is familiar to the participants are advantageous for the use of beginners.

FOREIGN MAPS

There are a great number and variety of foreign maneuver maps. The largest of these is the map prepared by Captain Feistle of the Bavarian army, representing a tract about fifty-five miles long and thirty miles wide, of the country in the vicinity of Metz, on a scale of about ten inches to a mile (1:6250). It consists of 326 sheets, grouped in five sections. The map is completely contoured but slopes are also shown by brown hachures. The prevailing color of the map is consequently brown which makes it a

pleasant one to use under electric light. The sheets are sold unmounted at about 18 cents per sheet but, for use, are usually mounted separately on card board. The map thus admits of a wide range of military operations and only a few sheets need be actually used at a time. A special guide map, one meter square, scale 1:100,000, has recently been prepared for use with this map, which is published by Hubert Köhler, Bluthenstrasse No. 13, Munich. The price of the entire map unmounted is about $50.00. This map is much used at the U. S. Army Staff College.

The general staff maps (scale 1:100,000) and the plane table survey maps (scale 1:25,000) of the country in the vicinity of Metz are almost indispensable adjuncts of the Feistle map; a space which represents on the Feistle map one minute of march represents on the 1:25,000 map four minutes, and the same space on the 1:100,000 map represents sixteen minutes. The sheets of the general staff map used with the Feistle map are the 568 Metz, 569 St. Avold, 584 Solgne and 585 Chateau Salins sheets. The corresponding sheets of the 1:25,000 scale map are designated 3551 Gravelotte, 3552 Metz, 3553 Bolchen, 3562 Ars a.d. Mosel, 3563 Verny, 3564 Remilly, 3575 Lorry and 3576 Solgne. A 1:200,000 scale map of the same region is also useful, especially in devising problems.

Maps of any part of the German Empire, scale 1:100,000 or 1:200,000, can be obtained from R. Eisenschmidt, 70 Dorotheenstrasse, Berlin.

The "Verny," "Gravelotte," "Metz," and "Ars a. d. Mosel" sections of the plane table survey map of the German Empire, scale 1:25,000, have been reproduced on a scale of ten inches to a mile, for the use of our Army War College, and copies of this reproduction can be obtained on application to the 2d (Military Information) Division of the General Staff. A map of the "Soest" corps maneuver ground,

suitable for use in the "great war game", was prepared in 1903 by Captain von Eynatten, German Field Artillery. This map consists of 150 sheets, each mounted separately on card board, and each representing 24 square kilometers on a scale of 1:10,000 or about six inches to a mile. It is published by Voss, Berlin, and is sold for about $25.00.

The German General Staff published in 1907 a war game map called "Buckeburg—Springe—Hannover", which is similar to the "Soest" map. It is in four colors and the scale is 1:10,000 (about 6 inches to 1 mile). It consists of 168 sheets and may be obtained, each sheet mounted separately on card board, through the American military attache at Berlin, for about $22.00. Several copies of the guide map, scale 1:100,000, are furnished with the map.

Other war game maps in common use in the German army are the "Chateau Salins" map, 96 sheets, scale 1:8,000, and the "Gumbinnen—Darkehmen" map, 70 sheets, scale 1:8,000, both made by the Royal Prussian Survey for the use of the army and not generally for sale. The "Chateau Salins" map is contiguous to the "Metz" map, and the "Gumbinnen-Darkehmen" map represents a portion of the Russian frontier. These two maps are merely twelve and a half fold enlargement of portions of the General Staff map and consequently are hachured maps with no contours. The process of enlargement has multiplied the distortion of the roads, hachures and conventional signs.

The Bavarian war game map called "Dachau", scale 1:8,000, consists of 56 sheets; it may be obtained from Hubert Köhler, Bluthenstrasse No. 13, Munich, Bavaria, for about $12.00; the guide maps are sold for 25 cents. This is also an enlargement from the General Staff map but the enlargement has been accomplished without the distortion noticeable in the

"Chateau Salins" and "Gumbinnen—Darkehmen" maps.

A map called "North Front of Paris", scale 1:5,000, in 77 sheets, price with guide map $24.00, is sold by Voss, Berlin. It is especially adapted to siege maneuvers (the fortress war game) but is also well suited to maneuvers in minor tactics. A map called "Sedan", scale 1:6,250, is also sold by Voss, Berlin, for about $8.00—it consists of 25 sheets.

For the strategic war game, German officers use the general staff maps of the German Empire, scale 1:100,000.

The maps of frontier districts. which have been chiefly used by the Germans until recently, have been found to lead to a monotony in the problems suggested, practically limiting the field of instruction to frontier warfare, and it is noticeable that the latest German war game maps are not of frontier regions. The smallest of their old maps ("Schweidnitz", "Landshut", etc.) have been discarded and have been replaced by new maps which are much larger.

There are six maneuver maps in use in the Austro-Hungarian army, named Trautenau, Poisdorf, Jicin, Wisokow, Grodek and Goerz. The scale of the four first named is 1:7500 (about $8\frac{1}{2}$ inches to 1 mile) and of the others is 1:12,500 (about 5 inches to 1 mile). A peculiar feature of the "Grodek" map is that all names are omitted from it; this seems logical, for the maneuver map is to be regarded, not as a map, but as the maneuver ground, and this arrangement compels officers to refer to their guide maps to learn the names of localities. The "Jicin" map has 126 sheets, and the "Grodek" map 48 sheets; the others are smaller. The "Jicin" (Gitschen), "Trautenau" and "Wisokow" (Nachod) maps are especially interesting as they represent the scenes of important engagements between the Prussian and Austrian forces in

1866. All of these maps are published by the Austrian Military Geographical Institute at Vienna, which also publishes a price list of them and of war game apparatus. The maps are sold at about twenty cents per sheet and can be obtained through the American military attache at Vienna.

The maneuver map in most common use in the French army is the "Commercy—Metz" map, scale 1:10,000, which is an eight-fold enlargement of a portion of the état—major map, scale 1:80,000. It was published in 1905 by the French General Staff, and is sold to officers of the French army for 10 francs. The état-major map, scale 1:80,000, covers the whole of France and is also frequently used in map maneuvers. An enlargement of this map, scale 1:50,000, can also be obtained. The foregoing maps are hachured merely and have no contours on them. The country within a radius of 30 miles of Paris has been mapped in 36 sheets on a scale of 1:20,000, with contours at a vertical interval of 5 meters. This map and maps of all parts of France on scales of 1:50,000, 1:80,000 and 1:200,000 can be obtained from R. Chapelot et Cie., 30 Rue et Passage Dauphine, Paris.

War game maps are especially made for the British army by the Ordnance Survey on a scale of 6 inches to one mile with contours at 10 foot intervals. Maps have recently been specially prepared of portions of each military district, so that each district has its own war game map. These are exchanged to some extent for the sake of varying the exercises but as the British combine the war game with instruction on the ground the most frequent use is made of the maps representing near-by tracts of ground.

The British "Combined Training" (Field Service Regulations) of 1905 prescribes (Par.184) that war game maps should represent: (a) localities within reach of the station at which the players of the game

are quartered, and should be of local interest; (b) localities at a distance from the station, possessing special features; (c) countries of general interest where wars have taken place, or are likely to occur in the future.

The "Surrey Hills" map—belonging to the Aldershot district, scale 6 inches to 1 mile, has generally been considered to be very suitable for map maneuvers; it consists of fifteen sheets, each 24 inches by 18 inches, and is sold (sheets mounted separately on cardboard) for £6. A war game map, scale 6 inches to 1 mile, called the "Berkshire" map, was made in 1907; it consists of 16 sheets, each 40 inches by 27 inches, and is sold unmounted for £2 or mounted on cardboard for £8. These war game maps (Surrey Hills and Berkshire) differ from the 6-inch scale Ordnance Survey maps only in having the contours specially marked, in being more completely colored and in the size of the sheets.

For the strategic war game, the Ordnance Survey maps, scale 1 inch to 1 mile, are used.

The London agent for the sale of the Ordnance Survey maps is Edward Stanford, 12 Long Acre, London; from him the "Surrey Hills" and "Berkshire" maneuver maps can be obtained, also the Ordnance Survey maps of any part of Great Britain on scales of 6, 1 or ½ inches to 1 mile.

British maps would be more convenient for our use, on account of the language and scales being more familiar, than other foreign maps, but the scale of these maps is not suited to maneuvers in minor tactics. No maneuver maps of a larger scale than six inches to one mile are now in use in the British army.

GUIDE MAPS

The maps to which we have heretofore chiefly devoted our attention are the large scale maps which do duty as the maneuver ground.

But each participant in a map maneuver should be provided with a pocket map of the maneuver ground and the country in the vicinity such as he would be expected to have in war; these are called guide maps and should show all roads, towns, and important natural features in the maneuver ground and, if practicable, within a day's march of it. They are used by the commanders for the same purposes for which such maps would be used in war, i.e. in studying situations, framing orders, etc. They are used by the director in devising problems, and are more convenient for this purpose than the maneuver map; they may often also be used by him when the opposing forces are not in contact at the outset—in carrying the exercise through the stages preliminary to contact.

In using foreign maneuver maps we find guide maps provided for use with them; they are merely portions of the military map which officers are expected to carry in war. But in using maneuver maps of portions of our own country we find ourselves confronted with the question as to what maps are to be used in case of war on our own territory.

The most suitable maps we have for this purpose are those made by the United States Geological Survey and our military authorities are taking steps to have these maps corrected and brought up to date and certain data of military importance added to them. These corrected and completed maps of the United States Geological Survey are called the Progressive Military Map; no copies of it are obtainable at present but it is supposed that, if needed, they will be available for use in war. The Geological Survey maps are on three scales,—1:62,500, 1:125,000 and 1:250,000 (about 1, ½ and ¼ inches to one mile). They cover only a small part of the country at present, being in general confined to localities where valuable

mineral deposits have been found, but they are being gradually extended.

Those now being made are all on the 1:62,500 scale and a great improvement is noticeable in them over the earlier issues. But these maps are not made for military use and are deficient in many details of military importance. For instance, the character of the roads, whether metalled or otherwise, is not indicated, and the maps are often so deficient in names of localities as to be of little use in directing the movements of troops.

These maps can be obtained by application to the Director, United States Geological Survey, Washington, D. C., and are sold at five cents per sheet.

The road maps made some years ago for the use of touring cyclists have been greatly extended to meet the needs of automobilists. These maps now cover the New England states (with the exception of Vermont and the northern part of Maine), the whole of New York and New Jersey, the northern part of Delaware, the central part of Maryland, the southeastern part of Pennsylvania, the northern part of Ohio and Indiana, and the part of Illinois in the vicinity of Chicago. They are on a scale of one inch to three miles and are useful maps for most military purposes. They are being extended by the American Automobile Association and seem likely to become an important military factor. Copies of these maps can be obtained from the Automobile Road Map Company, 1964 Broadway, New York, N. Y.

The military map of Germany is the General Staff map, scale 1:100,000 (about two-thirds inch to one mile). It is said that this famous map was begun by Napoleon Bonaparte, who ordered his engineers—immediately after the battle of Jena—to make a map of Germany, and ordered that the scale be 1:100,000. This is the oldest of modern military maps, and

although its scale is smaller than that of many others, it is the most complete in information of military importance. The character of all roads and trails is shown graphically; ground practicable for troops of all arms is shown by dotted hachures; the number of men that can be quartered in a village is approximately indicated by the style of lettering of its name; the summits of all hills are conveniently designated by reference numbers showing their elevation. The Germans also have a contoured map, scale 1:25,000, but it does not extend over the whole of their territory and it is not regarded as a military map.

The scale of the military map of France (Carte de l'Etat Major) is 1:80,000 (about three-fourths inch to one mile). The scale of the military map of Austria is 1:75,000 (about four-fifths inch to one mile). That of Japan is 1:200,000.

The British Combined Training (Field Service Regulations) directs that maps one-half inch to one mile (1:126,720) be used in field maneuvers and it is inferred that this map is to be used by British officers in case of war on British territory.

Hill slopes are shown on all of these military maps by hachures only. The elevations of the summits of hills and other important points are shown by numbers.

"In France, the état-major map is a weapon with which officers are constantly exercised and their proficiency in its manifold uses is considered as important as proficiency with pistol or saber." (Captain T. B. Mott.)

Excellent military maps were made by topographers who accompanied Sherman's army in the campaign in Georgia in 1864; since that time military map making seems to have received little attention in this country.

TABLE

The table on which the maneuver map is spread should be of soft wood if maps mounted on cloth are to be used. If the top of the table is seven and a half feet long and four and a half feet wide it will be of a convenient size; the top may be supported by trestles two feet four inches in height. There is an advantage in having the top easily detachable from its supports, because the top is sometimes used standing on end—the map being fastened to it with thumb tacks—in illustrating lectures, discussions and one side maneuvers. Ordinary hard wood desks and tables may be used to support the maps; and maps mounted on cloth can be used on them by placing two or three thicknesses of blotting paper under the map.

BLOCKS

Troops are represented in map maneuvers by a variety of means—the most common being rectangular blocks of type-metal, lead, ivory, bone, porcelain, wood, or other material, cut to the size of the space occupied on the map by the units which they represent.

"To make the exercises attractive and to stimulate the imagination of beginners" (Immanuel) small figures are sometimes used; for instance, the figure of an infantryman standing represents a company in column or line; a figure of a trooper on a horse represents a squadron; a figure of a gun, a battery, etc. Each figure stands on a foot board cut to show the space occupied by the oganization represented.

It is objected to lead and type-metal blocks that the paint with which they are coated soon scales or wears off or becomes soiled by handling, and that they then become unsightly and are not easily recognizable. Porcelain blocks hold their color better, but

they are so light as to be readily disturbed by draughts of air, or jars to the table; wood is also too light.

Representations of troops cut from cardboard have been improvised at trifling expense by the Department of Military Art, Army Service Schools, which meet all the necessary requirements of map maneuvers. Blue paper is used to represent infantry —red, artillery—yellow, cavalry—black, engineers— green, hospital corps—orange, signal corps—buff, wagon trains, etc.; platoons are represented by squares, larger units by rectangular pieces cut to scale, and squads by small circular discs. The pieces are held in place or moved by means of pins with colored heads—blue for the Blue army and red for the Red army. Cardboard blocks lend themselves readily to changes of organization;* and can be conveniently used on a map in a vertical position— a great advantage in one side maneuvers and discussions.

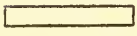
* Since the use of these card board blocks was begun, changes have been made in the blocks representing units of artillery, the medical department and the signal corps.

The shapes and sizes of the smaller pieces are shown below; the larger pieces are shown by Plate No. 2.

Infantry Company

" Platoon

" Squad


Cavalry Troop

" Platoon

" Squad

" Machine Gun

3 inch Gun, F. A.

Arrangements have been made by the Secretary of the Army Service Schools to furnish at a reasonable price small boxes containing sets of these card-board blocks together with colored pins, strings of beads, and card-board scales to officers desiring them.

It is obvious that similar blocks could be made of metal, bone, wood, or other material if desired. It has been objected to the pins that they are injurious to the maps, but in practice it is found that the pins are not moved about a great deal, as but few situations are fully represented; and that if the maps are

well mounted they will wear out through other causes before they are seriously injured by the pins.

The blocks in most common use in the German army are those devised by Col. von Busse; these are sold by G. Bormann Nachfolger, 39 Bruder strasse, Berlin, at about $7.50 per set. A more elaborate and expensive set has been devised by Col. Kunde and is sold by Voss, bookseller, Berlin. The blocks devised by Meckel have recently been revised by Capt. Count von Eynatten and are much used; they are sold by Voss, Berlin, at about $7.00 per set.

A French war game set is sold by R. Chapelot et Cie, 30 Rue et Passage Dauphine, Paris, at about $4.00.

A set of British war game blocks, complete in a mahogany box, is sold by Edward Stanford, London, for £6 s.6.

It is obvious that foreign blocks would be of but little use to us as the units represented are different from ours; also that blocks made in this country before the publication of our Field Service Regulations (1905) are now unsuited to our use for a similar reason.

Blocks should correspond to the scale of the map used; if used with maps of other scales they are likely to give wrong impressions.

Officers are recommended to improvise their own blocks and scales; they can thus avoid unnecessary expense and can assure themselves that the pieces are cut accurately to the scale of the map they intend to use, and that they represent modern American units.

SCALES

The scales most frequently used are scales of yards and of miles. A useful scale can be improvised by drawing a scale of yards on a strip of paper and

a scale of miles and fractions of a mile on another, and gluing them on opposite edges of a straight strip of wood of, say, eighteen inches in length. A similar scale made of card board is very convenient as it can be stood on edge on the map and bent to follow the turns of a road.

Scales of minutes of march are convenient and save time. Such scales can be drawn on the edge of a piece of cardboard to represent any desired rates of march. It is a convenience to have several divisions of the same length placed consecutively so that any desired number of minutes can be laid off at one time. Scales of this sort arranged for the ordinary gaits are shown in Plate III. Two of these scales used simultaneously afford a ready means of ascertaining practically (without computation) the time and place at which troops moving at different rates will meet or overtake one another. This problem arises frequently in determining the time and place at which messages are received. The manner in which it is solved by using scales of minutes is described in Preliminary Exercises Nos. 1 and 2, Chapter IV.

For determining practically the length of columns, the depth of various units in column (battalion, squadron, battery, etc.) may be drawn on the edge of a card and used as a scale as shown by Plate II.

Another convenient scale of minutes of march may be made by taking a piece of sheet brass and cutting it so as to leave projecting points at the proper distances apart to represent the distances marched at the different gaits in a certain time; such a scale, cut to show two minutes of march at the ordinary gaits, is of convenient size for use with maps whose scale is 12 inches to 1 mile—a pattern is shown in Plate I.

combat t

PLAT

th combat
yards.

Cavalry and F.A. - Trot - 440 yards.
Cavalry or F.A. - Trot - Gallop - 660 yards.
Mounted Messenger - Gallop - 880 yards
Inf. not halted 176 yards.
Cav. or F.A. Walk 220 yards.
Cav. or F.A. Walk and trot 293 yards.
Infantry 160 yards

PLATE I.

Two (2) Minutes

of March

Scale

12 inches to 1 mile

Co. Mngr's 150 Yds.
Field Batty with combat train 320 yards
Map Distance-V.1.5 ft.
Company 40 yds.
Battalion with combat train 210 yards.
Troop 90 yds.
Squadron with combat train 420 yards.
Scale of Yards 12 inches to 1 mile
440 yards - 1/4 mile
Infantry quick time (including halts) 5½ min.
" not halted 5 "
" double time 3 "
Mounted messenger 1 "
440 yards - 1/4 mile
Cav'y or F. A. walk 4 min.
" " " walk & trot 3 "
" " " trot 2 "
" " " gallop 1-1/3 "
" charging 2/3 "
0 1 2 3 4 5 6 7 8 9 100 1000

PLATE II.

Cavalry and F A - Walk
110 yards per min - 3 3/4 miles per hour.
Cavalry and F.A. - Trot - 220 Yards per Minute
7 1/2 miles per hour
SCALES OF MINUTES OF MARCH
FRESH TROOPS ON GOOD ROADS
12 in to 1 mi. R.F. 1/5280.
Mounted Messenger - Gallop - 440 Yards per Minute
15 miles per hour.
Infantry or Mixed Troops
80 yards per min -2 8/11 miles per hour.

PLATE III.

Scales of minutes of march should be used only by the director or his assistant. Commanders should use their guide maps and the scales found on them in making the computations of time and space necessary in estimating situations and framing orders, and they will obtain useful practice in map reading by doing so.

A useful scale can be made by cutting out Plates II and III and pasting them on opposite sides of a piece of card board of the same size.

OTHER ACCESSORIES

Paper and pencils are important accessories. A number of message blanks should also be provided. The only books of reference needed are the Field Service Regulations, the drill regulations of the different arms, and the service manuals.

CHAPTER III

HOW CONDUCTED

METHODS

Map maneuvers have been conducted in a great variety of ways, and beneficial results have probably been obtained from all.

"For an officer who is to conduct a war game, that method is best in which he has trained himself." (Meckel.)

"The war game knows no fixed rules. * * * The development of personal initiative, without which no war game can be of real benefit, must not be restricted by regulations and set schemes. * * * Good results may be obtained by a great variety of methods. * * * The war game stands or falls with the director." (Immanuel.)

The manner in which a map maneuver is to be conducted should depend primarily on the object to be attained. If it is desired to give didactic instruction in tactics, or to explain the nature of map maneuvers to officers who are not familiar with them, the instructor may maneuver two forces on a map himself, illustrating, explaining and commenting on such situations as serve his purpose; this would be an illustrated lecture rather than a map maneuver.

But if the instructor conceals one of the forces wholly or in part, and consults his audience in regard to the movements of the other, or allows the audience to decide its movements, while commenting upon, criticising and correcting their decisions if neces-

sary, and using the concealed hostile force to demonstrate faults and weaknesses which he observes in the dispositions made—the exercise becomes a one side map maneuver. Exercises of this kind may be supplemented by discussions in which several or all officers present may take part ,under the leadership of the director (instructor); they combine didactic instruction with practice in estimating situations, forming decisions, and giving orders.

But if it is desired to heighten the interest of the exercise by bringing about a contest of opposing wills and unexpected situations similar to those which arise in war, different officers or groups of officers may be designated to command the opposing forces, each party given only such information of the forces of the other as they would be likely to possess in war, or such as is gained through the development of the exercise, and be given freedom of decision in commanding the forces assigned to them. The maneuver is then two sided; but the director may still retain sufficient control of it to be able to guide it into channels which he thinks will make it more interesting or instructive, or which will illustrate certain principles of tactics which he desires to teach. This control should not be exercised in such a way as to deprive commanders of freedom in making decisions, but by means of plausible orders from imaginary higher authorities, by timely information of the enemy, by the intervention of supporting troops, by decisions on the results of hostile contact, or by interpretations of the map.

Under the guidance of a skillful director, the two side maneuver, as well as the one side maneuver, may be made, in a measure, an illustrated lecture, the didactic instruction being postponed till the close of the exercise. This is the highest and most beneficial form which the two side maneuver can assume; but

it requires serious preliminary preparation on the part of the director, no matter what his experience and professional attainments may be.

If, however, the maneuver is merely intended to give additional training and experience in the handling of troops, to test the efficiency of certain tactical measures, to test the defensive strength of a certain position, or if the director has but little or no more instruction or experience than the commanders or has had little opportunity for previous preparation; the commanders may be given full freedom of action after the initial situation has been imparted to them, the director acts merely as an umpire and limits his efforts to making his decisions plausible and impartial; the exercise should, however, always be followed by a discussion for the purpose of determining upon the conclusions, if any, which can be drawn from it. Maneuvers of this sort accomplish the best results when all of the participants are well instructed and experienced officers. The methods which should be employed at the beginning are those which make the greatest demands upon the director.

The kind of instruction desired also determines the character of the problems—whether involving instruction in the tactics of a single arm, the tactics of the arms combined, the employment of divisions or larger bodies, the attack and defense of fortified positions, in logistics, or in the duties which will devolve upon the higher staffs in war. The problems may be simple, involving the normal employment of troops under definite requirements, or they may be made more difficult with the object of taxing the ingenuity of the commanders.

The maps and other facilities available must also be considered, for it may be necessary to adapt the exercise to the facilities available instead of to the object desired. Maps of portions of our own country

are to be preferred, as exercises upon them are more realistic and impose less strain upon the imagination. Large maps are to be preferred to small ones; for small maps restrict us to the employment of small units, to single phases of military operations, or to maneuvers in which the forces are restricted to certain localities, for instance, in the attack and defense of a designated position.

PRELIMINARY INSTRUCTION

The degree of preparation or experience of the officers who are to take part in the maneuver must also be taken into consideration, in deciding upon the character of the problems to be used and the methods to be employed in conducting them.

Lieutenant General v. Litzmann, Director of the German War College, in a work entitled "Introduction to the War Game" (1905), says: "It is essential to success that the director should not assume that he or other participants in the exercise have knowledge or skill which they do not really possess. * * * It is only by actual practice with tools that a mechanic learns to turn out good work. Beginners at the war game must be taught by means of preliminary exercises how to find their way about easily on a war game map, and how to use the blocks, scales and other apparatus. When they have learned this they are prepared to act as commanders, at first in simple exercises and afterwards in maneuvers presenting greater difficulties. * * * The difficulties must be mastered step by step. * * * Dissatisfaction with the war game is generally a consequence of not having thoroughly mastered its technicalities."

To illustrate his ideas as to the manner in which preliminary instruction should be given, General v. Litzmann takes the hypothetical case of 1st Lieutenant Z, a recent graduate of the War College, who

has just returned to his regiment and has been assigned the duty of instructing the ten youngest lieutenants of the regiment in the war game. The work of Lieutenant Z and his pupils during the first three evenings is described in detail, and the manner in which the instruction is to be continued is indicated.

At the first meeting Lieutenant Z explains the use of the maps and the meaning of the blocks and then assigns the lieutenants to various tasks. Lieutenants A and B are directed to represent with blocks a Blue infantry division advancing on an indicated road with the head of the main body at an indicated point. When this is finished they are asked to show all parts of the advance guard in the positions which they would occupy five minutes later. Lieutenants C and D are assigned a Red officer's patrol and directed to select a good point of observation from which the road on which this Blue division is advancing can be watched. This is a problem in map reading, and its solution brings out an explanation of a method of determining from the map the visibility of one point from another. Lieutenants E and F are directed to show with blocks a detached Red infantry brigade with attached troops of other arms, in a defensive position at an indicated locality towards which the Blue division is marching. Lieutenants G and H are directed to prepare a plan for attacking this Red position with the Blue division. Lieutenants J and K are directed to show with blocks the outpost of a detached Blue infantry brigade having attached troops of other arms—the brigade being in bivouac at an indicated locality.

At the end of a half-hour Lieutenant Z discusses these problems and their solutions pointing out errors and suggesting better dispositions. He then carries out on the map a small cavalry engagement, commanding both parties and acting as director him-

self—the other officers taking part only as spectators. He concludes the first evening's work by informing them that at their next meeting they are to carry out the attack planned by Lieutenants G and H on the position selected by Lieutenants E and F, and requests them to study certain portions of the artillery drill regulations.

He begins the second evening's work with a short discussion of the subject of orders and then assigns the lieutenants to subordinate commands in the Blue division—taking chief command of the Blues and entire control of the Reds himself. The attack is carried as far as time admits, great attention being paid to the movements and positions of troops, the lieutenants interposing orders when it seems to them proper to do so. The exercise is closed with a discussion which relates chiefly to the technicalities of conducting maneuvers on a map, and the lieutenants are requested to study certain additional portions of the artillery drill regulations.

The exercise for the third evening consists in a deployment for attack by the advance guard of a Blue detached brigade of infantry having troops of other arms attached. The advance guard consists of a battalion of infantry and a battalion of artillery. Lieutenant Z commands the Blue brigade and takes entire control of the Red forces as before. The lieutenants command the battalions, companies and batteries, and one acts as assistant to Lieutenant Z. A measure of independence of action is given to them and the exercise is carried to a more advanced stage than the preceding one.

It will be seen that Lieutenant Z begins his course of instruction with map problems on the war game map and follows these with an illustrated lecture and one side maneuvers. After the third evening the lieutenants under instruction are thought ready

to take part as commanders in actual war games of a simple character involving the use of only small bodies of troops.

In answer to a possible objection that in these exercises officers were given larger commands than their experience warranted, General v. Litzman replies: "The difficulty of leading troops does not lie in the numerical strength of the body employed but rather in the conditions under which it is used—these were purposely made simple."

Captain Oberlindober recommends preliminary exercises before taking up map maneuvers, for the purpose of giving practice in forming decisions quickly; these exercises consist in calling officers to the map separately, giving them military situations and asking their decisions; they are virtually map problems with oral solutions.

Experience at the Army Service Schools has shown that map problems with written solutions serve as an excellent preparation for map maneuvers.

A knowledge of map reading is almost the only essential to the student in taking part in a one-side map maneuver; while to be able to take part profitably in a two-side map maneuver he should, in addition, be familiar with the handling of troops and have some experience in handling them on a map.

ONE-SIDE MANEUVERS

The simplest maneuvers are those in which no enemy is supposed to be in contact with the troops employed, and those in which the enemy is imaginary or merely outlined. Such exercises are valuable as a means of instruction in tactics, and map maneuvers are well adapted to them. Map maneuvers in which but one side is represented may be made very interesting as well as instructive; they have never received the attention which they merit.

"To many persons, a map maneuver (to call it by its French name) means necessarily the organization of two parties to operate against each other with perfect freedom, the director acting as an umpire. This method undoubtedly has great advantages; it gives opportunities for practice to a large number of officers; the participants take an interest in the contest with a real enemy, who is equally in the dark as to the dispositions of his adversary. This reciprocal ignorance may bring about the most unexpected situations, similar to those which arise in actual war.

But there is another side to the question. The umpire cannot act until both parties have made their decisions. On this account, the exercises progress so slowly that the interest in them is often lost. Faulty work does not always receive a suitable penalty. If the adversaries are not well instructed in tactics, the maneuver degenerates into a series of disjointed movements, often devoid of interest.

Like two students of the art of fencing who have been permitted too early to fence freely with each other, the two sides slash away without learning anything. Instruction in tactics should follow the same course as instruction in fencing; first, lessons in the cuts and thrusts; then, practice with the instructor, who gives opportunities for using them and who criticises faults; and last, free fencing. In studying tactics it is necessary to practice with the instructor for a long time,—that is to say, to handle one force at a time. The enemy is handled by the instructor, who is thus enabled to set for us any desired problem; or else by a well instructed assistant who, after a preliminary understanding, is given freedom of action. There is no delay imposed upon the director, who gives the exercise the form he wishes, sometimes asking for prompt decisions, sometimes

bringing about general discussions; and is always able to decide immediately the results of the measures taken. No assistants, no notes. The director brings about successive events and places representations of them before the eyes of the students, and thus holds their attention." (Une Manœuvre sur la Carte, Revue Militaire Generale, March, 1907).

"The one side maneuver is, at first sight, less attractive than the two-side maneuver. It is, however, especially for beginners, much more instructive. By means of the one-side maneuver an officer can teach his subordinates more rapidly than in any other way the spirit of the drill regulations and develop their tactical sense.

In the one-side maneuver the director commands the hostile force himself, and makes use of it to bring out the tactical lessons which he wishes to teach, and to show the mistakes which have been made. If a unit is not sufficiently covered, he causes hostile troops to appear suddenly and throw it into confusion; if a force is too much scattered, he causes it to be attacked at a selected point by a hostile force which is well in hand; if a leader is too timid, he opposes him with a mere screen and then shows him that he has allowed himself to be deceived.

"In a two-side maneuver, it may happen that many of the mistakes which are made are not pointed out; this would, perhaps, be the case in actual war; but the lesson is none the less bad; the repetition of the same mistakes or uncorrected carelessness tends to establish bad habits.

"It may be objected that the part of the director, commanding one of the forces and knowing the movements of the other, is too easy from a tactical point of view. This would be true if it were a contest or a game; but there is no contest and no game; the director does not compete with the student

officers, he teaches them." (Jeu de Guerre et Manœuvre sur la Carte, Revue Militaire Generale, Jan. 1907.)

One-side maneuvers have many evident advantages. More students can profitably take part in a single exercise, the exercise is more completely under the control of the director, who can guide it into interesting and instructive channels, can pass rapidly over stages which are not interesting, and linger upon those which are more profitable. The discussion is continuous, all participants are kept fully informed of the military situation and there are no dreary waits in an outer room.

Nevertheless, they have their pitfalls and their limitations. If the director, when permitting students to command, always defeats them with the concealed hostile force (which, of course, he can easily do) or exposes them to ridicule, he will only discourage them and give them the impression that they have been unfairly treated. And the student is not always convinced that the measures which the director characterizes as mistakes are really such. Broadly speaking, it may be asserted that the one-side maneuver is the better vehicle for instruction—the two-side maneuver the better means of giving training and practice. Instruction presupposes an instructor; and one-side maneuvers accomplish the best results when the director, by reason of greater experience, superior advantages or special preparation, can speak with the voice of authority. Directors of this sort are not always available; and, in any case, there is a point in military education when didactic instruction should no longer be its predominent feature and opportunities should be given for practicing what has been learned.

In conducting a one-side maneuver the troops employed may be fully represented with blocks, as it is not necessary to conceal any of them from the

students, who are all supposed to belong to the same side. If the number of students present is so great that all can not see the map well in its ordinary horizontal position, it may be suspended vertically. The students are then seated in front of it and can thus follow the exercise more comfortably. The director describes and represents the initial situation and asks the opinions of the students as to what action should be taken, how contemplated measures should be carried out, etc. He comments upon the opinions advanced and may invite a general discussion of them. When this situation has been sufficiently discussed (and the director's tact will be displayed by neither continuing to discuss a situation after it has been worn threadbare nor leaving it prematurely) the director announces the movements which were actually made, describes and represents the new situation, supplying information of the enemy when necessary, and another discussion follows. In deciding upon the movements to be actually made the director may either follow the opinions of one or more of the students or make movements not contemplated by any of them; but where different measures are suggested which seem equally judicious it should be made plain that the decision does not indicate that those not adopted were thought faulty.

The director may follow out opinions which he believes to be faulty for the purpose of showing the weakness of the dispositions which would result, but it is believed that this can generally be accomplished by the discussion and that the best progress will usually be made by following out measures which are believed to be judicious—both the director and students remaining in sympathy with the commander.

As an evidence of good faith the director may write out, before the exercise, a special situation for the hostile force. At the close of the exercise this is

shown to the students and an explanation is made that the strength displayed by the enemy was no greater than was originally contemplated, and that the movements made by him were possible and consistent with the original situation. Or the director may make it a rule that any hostile troops which have once been shown must be accounted for at the close of the exercise and will not be used in any unusual way or in a manner inconsistent with the enemy's supposed mission. But if it is made clear to all that the exercise is not a contest between the students and the director, these precautions will usually be unnecessary.

TWO-SIDE MANEUVERS

Two-side map maneuvers have important advantages and will probably always be regarded as the highest form of the exercise and be the form most frequently used. There is a closer approximation to the conditions of war, for there is an actual contest and greater interest is aroused. Responsibility is thrown directly upon the commanders, who thus acquire training in bearing it. The lessons taught are more convincing and are more indelibly impressed upon the memory.

The one-side maneuver is likely to develop cautiousness and conservatism unduly, for in seeking to avoid what the director may regard as mistakes students may shrink from the risks sometimes necessary to gain important successes. And in one-side maneuvers the commander of the hostile force is assumed to be able and aggressive—at all times ready to take advantage of any weakness in our dispositions, while two-side maneuvers give a commander an opportunity to gauge his opponents, to make use of his knowl-

edge of their personal characteristics, and to shape his own course accordingly.*

In two-side maneuvers both commanders are given freedom of initiative, hampered only by the missions assigned them and by the requirements of the military situation. The director's chief role is to furnish each such information of his enemy as is likely to be gained through the progress of the maneuver, make needful interpretations of the map and decisions as to rates of march, visibility, results of contact, etc., and to lead the discussion which closes the exercise.

The manner in which two side map maneuvers are conducted is best learned by taking part in such maneuvers conducted by a skillful and experienced director. Officers who have no opportunities to learn in this way can get a very good idea of them by following out, step by step, with a map and blocks or pins, the exercise described by Von Verdy (Simplified War Game) those described by Immanuel (The Regimental War Game) by Von Litzmann (Einführung in den Betrieb des Kriegsspiels) by Oberlindober (Anlage und Leitung von Kriegsspielen) in "Das Kriegsspiel, Anregungen, Erfahrungen und Beispiele" (Anonymous) or those contained in chapter IV of this work.

In the present chapter it is merely intended to offer suggestions which may be found helpful by beginners.

PROBLEMS

A commander is informed of the initial situation by the director either orally or by means of a written statement called a problem. Maneuver problems are

*Such decisions as that of General Lee in halting behind Antietam Creek and accepting battle with the Potomac at his back—or in dividing his forces at Chancellorsville in the presence of a superior enemy—would, in a one-side maneuver or in a map problem, be regarded as mistakes: but when the personality of the opposing commander is taken into account they may be very far from being mistakes.

usually drafted in two parts, called the "general" and "special" situations.* The same general situation is usually given to the commanders of both the opposing forces; it contains information of the principal features of the military situation of both forces; and a commander consequently learns from it not only the main features of the situation of his own and the enemy's troops, but in addition, what the enemy may be expected to know of them. If a general situation is not used it will be found more difficult to describe briefly a military situation so completely that a commander will be able to draw inferences as to the information probably possessed by the enemy; the problem can usually be made shorter by conveying information of this kind to both parties alike by means of a general situation. As a matter of convenience, the date, any statements regarding the weather thought necessary, and any suppositions made concerning the terrain (the depth of streams, condition of roads, etc.) are usually also placed in the general situation; for this information is supposed to be possessed by both parties, and, by placing it in the general situation, it need be drafted but once. When it is thought necessary to state which force is operating in its own and which in hostile territory, this information is usually placed in the general situation.

A special situation is prepared for each commander; it usually contains a list of the troops he is to command, and should inform him of their location and the exact hour at which the operations involved in the solution of the problem are to begin. When a definite mission is to be assigned to him it is ordinarily placed in the special situation. The special situation also usually contains information of the

*It is not necessary to draft map problems and those for terrain exercises in two parts, though this is often done for the purpose of acquiring greater familiarity with maneuver problems.

enemy; but this, as a rule, is restricted to the results of his own observation or of recent reconnaissance, and ordinarily consists of details which the enemy is not likely to be aware that he possesses.*

Problems should be short. Situations covering a page or more of written matter have a discouraging effect. Problems are sometimes seen with very lengthy general situations, which show an effort to write a resume of the imaginary war which has led to the situation described; and, after reading two or three pages, we discover, perhaps, that the situation is a simple one which might have been described in a dozen lines; it then becomes apparent that the commanders might have been spared the apocryphal historical matter. It is true that in war officers are often confronted with orders and information contained in numerous and sometimes conflicting messages and reports, and that training in sifting masses of such matter is useful; but practice of this kind can be given more appropriately by means of map problems than by maneuver problems.

The forces employed should be small. The size of the forces employed should be proportioned to the degree of instruction and experience of the officers who are to command them, and, as a rule, they should be relatively small. "The smaller the forces employed, the more details can be noticed, the more

*The problems used in map maneuvers and tactical rides are often shorter and more meager in details than those used in field maneuvers, map problems or terrain exercises, for the reason that the director has the exercise completely under his control, and can unfold the situation more fully during the progress of the exercise. Thus, the sound of distant cannonnading may be heard, orders may be received from higher authorities, additional troops may appear on the scene, supporting troops may advance or suffer a reverse, or other circumstances may be conjured up at the will of the director and the situation may be materially modified at any time. Devices of this kind are seldom employed in field maneuvers and, as a rule, the situations presented in map problems and terrain exercises should be complete at the outset. In map maneuvers, however, information in regard to the weather, condition of the roads, etc., should either be contained in the problem, or else supplied by the director orally; while in field maneuvers the actual condition of weather and terrain are ordinarily taken as part of the situation. A discussion of war game problems, by Captain A. L. Conger, in which the distinction between map problems and maneuver problems is clearly defined, can be found in the March, 1910, number of the Cavalry Journal.

thorough the discussion can be made. * * * When large forces are employed, details of great importance to the majority of officers are necessarily excluded from consideration'' (Meckel). The chief objection urged against the employment of small forces is that exercises of this sort are thought unreal. The conflicts of entirely isolated small bodies seldom lead to important results. In war, the commanders in chief will usually keep all parts of their armies in position for mutual support and are more likely to use all of them for the attainment of a common object (for instance, the defeat of the chief army of the enemy) than to permit them to engage in isolated and independent combats. Captain Oberlindober recommends that the attention to details, which Meckel insists on, be secured by limiting the attention to a part only of the troops considered, and suggests problems involving the employment of covering detachments (advance guards, rear guards, flank guards, outposts, etc.), the main bodies not being actually represented; or problems involving troops in only a portion of the field in a general engagement—for instance, the troops employed in an enveloping movement or the contact of divisions near the center of opposing lines.

It is not necessary that the forces assigned to the opposing commanders be equal in strength or similar in composition. When equal forces are brought into contact with each other under approximately equal conditions, the exercise is often brought to a standstill and a long drawn out combat follows; it is not easy to decide the result, and the justice of the decisions is not always apparent. In exercises in ''retreat and pursuit,'' a disparity is necessary to the progress of the exercise. Maneuvers in which the opposing forces are composed of different arms or in which the various arms appear in different proportions are especially interesting and instructive in con-

trasting the powers, limitations and peculiar functions of each.

If a sufficient familiarity with the tactical employment of companies and battalions has already been gained through field exercises with troops (which are, of course, more valuable than map maneuvers) problems involving larger forces and introducing other arms should be taken up early; for only a limited view of the field of tactics can be gained from the use of very small forces or of only one arm of the service.

Sometimes one of the contending forces is supposed to be composed of foreign troops, presumably for the purpose of giving instruction in the organization and tactics of the armies of nations with whom we may at some time be at war; some useful results may, no doubt, be gained in this way, but it should be remembered that facility in handling our own troops is the object of the first importance to us.

The situations presented should be plausible. Officers are not readily interested in situations which appear unnatural or strained; and commanders can not form decisions unless the situation is one which they can comprehend. If the situation appears to be such as might be expected to actually occur in war, the participants will more readily become interested in it and will act with greater promptness. The most plausible problems are those based upon actual situations or events drawn from military history. The director, by narrating the historical incident upon which the problem is based can add greatly to the interest of the discussion, and the results which really occurred often throw light upon tactical questions raised by the maneuver. Problems of this kind have the additional advantage of stimulating interest in the study of military history.

It is best to begin with problems of a simple character—i.e., in which the missions of the oppos-

ing forces are definite and tangible. For example, one party may be instructed to march from Kickapoo to Leavenworth and the other be instructed to march at the same time from Leavenworth to Kickapoo; or one party may be instructed to hold a position and the other to attack it, etc. If it is desired that contact should take place at a particular locality the director, in framing the problem, measures back from the selected point and starts the opposing forces from positions they might have occupied at a certain time, say a half-hour, before meeting. If it is to be a problem in attack and defense the force on the defensive may be moved back only half as far in order to give time for the occupation of the position. Many problems can be framed bringing about rencounters in which the opposing columns approach each other at various different angles; and the deployments in different directions incidental to these exercises form a very valuable training for all officers. Problems of this kind are problems of execution only but they cover an important field of instruction which should not be overlooked. When a considerable degree of experience has been gained, it will be better to employ problems which leave the commanders free, to some extent, to act on their own initiative. For instance, an officer may be assigned command of a detachment in the theater of operations and informed of the approximate situations and objectives of the main bodies of the opposing armies but given instructions of only the most general character, or instructions which are not recent and which evidently contemplate a different situation from that which appears to exist. Very interesting problems may be framed where one or both commanders may be forced or induced to abandon their original missions and adopt new ones on their own initiative. A body of troops may be sent on an offensive mission, but

before reaching its objective unexpectedly encounters superior hostile forces; if the commander does not promptly realize that the original mission must be abandoned and act in conformity with the requirements of the changed situation, he will expose his troops to destruction without accomplishing any adequate results. For instance, a force may be ordered to pursue energetically a fleeing and disorganized enemy and subsequently finds itself confronted by a strong body of fresh hostile troops; if the commander of the pursuing force does not quickly draw correct inferences from the changed demeanor of the enemy he may dash his troops to pieces in an unguarded and ill considered attack. Or the commander may be tempted to exchange his original mission for one which appears to be more important. By exercises of this sort military insight is sharpened and the offensive spirit is fostered.

Problems should be varied and progressive. The object of the maneuvers, as a means of instruction, should be kept in view; the problems should be adapted to the proficiency of the participants, should be drafted so that the resulting exercises will illustrate different lessons in military art, and should progress from the simplest exercises to those presenting greater difficulties. These considerations should be kept in view in drafting the problems for both sides in two-side maneuvers.

The opposing forces are sometimes started at a considerable distance from each other and merely given missions which will bring them in contact. Events then develop according to the movements decided upon by the commanders, and the form which the exercise will assume cannot be foreseen. While exercises of this kind are occasionally desirable, as for instance, when instruction in reconnaissance is desired, there can be no certainty as to the other

tactical measures which will be illustrated, and the amount and kind of instruction which may be given is left to chance. It is apparent that no complete or systematic instruction can be given by adhering exclusively to this method.

Sometimes the forces are placed in contact at the outset and each commander is given such information in regard to his adversary as he would be likely, in actual operations, to possess. The latter method is especially adapted to the ordinary purposes of map maneuvers on account of the limitations of the time which can be allotted to a single exercise. By placing the troops at once in situations which we desire to illustrate, or which will give point to a lesson which we desire to teach, we can be sure of covering the desired ground in the time available; otherwise there is danger of the time being consumed by preliminary movements which are not especially instructive, or which do not illustrate the desired situations.

A fresh problem should be prepared for each meeting. It sometimes happens that the time allotted slips away before the exercise has developed far enough to illustrate clearly the lesson which the director has in mind, and there is a temptation to postpone the completion of the exercise to another meeting. If this is done, there can be no full discussion of the course of events up to that time without disclosing to each party the situation of the other. If the discussion is postponed its value is impaired, for it is of the greatest value when the events discussed are fresh in the minds of every one. Besides, officers are not likely to take as much interest in the completion of an old problem as they would take in a new one.

For use as an aid in devising problems, the large scale maneuver map ordinarily will not be so con-

venient as the guide map, or other small scale map showing the tract covered by the maneuver map and the adjacent territory.

HOW INITIATED

The "situations" may, of course, be given to the commanders either at the beginning of the exercise or at any convenient time before; but it is customary to follow one of the four methods described below.

1. The problem is transmitted in writing (sealed) to the commanders a day or two before the exercise begins. This method is suitable when the participants have had but little experience or when the problem presents unusual difficulties. In this case commanders are usually required to submit their first orders in writing—and sometimes also a written estimate of the situation—to the director before the time set for the exercise.

2. The problem is transmitted in writing to the commanders a half hour before the exercise. This method gives them time to familiarize themselves with the situation, to reflect upon the courses of action open to them, and to form their decisions; it approximates the conditions of war, for in actual service commanders are always familiar with the greater part of the elements of the military situation, and the most rapid decisions are based on conditions which present but few new features. In this case the commanders are expected to be ready to announce their decisions and give their orders when they are first called to the map.

3. The problem is given at the beginning of the exercise. One of the parties—say the Blue—is called to the map; if the situations are in writing the commander reads them aloud to his assistants, otherwise the director communicates the situation orally. The members of the Blue party refer to the map to famil-

iarize themselves with the localities named and retire. The situation is then communicated in a similar manner to the Red party and, when they have retired, the Blues are again called to the map, the Blue commander assigns his assistants to subordinate commands, communicates his intentions and orders to the director, and the maneuver begins.

This method, no doubt, offers less opportunity for reflection than would ordinarily be the case in war. But one of the greatest benefits to be obtained from map maneuvers is practice in estimating situations rapidly and in forming decisions promptly, and it is believed that—for officers who are familiar with this work—it will generally be found to be the most suitable.

4. There is another method of starting a map maneuver which is frequently used in the German army and which possesses many advantages. A day or more before the exercise, the problem for the Red commander is sent to each of the officers assigned to the Red party, and the problem of the Blue commander is similarly sent to all the Blues. Certain definite requirements are appended to the problem—for instance the commander's estimate of the situation and initial orders may be asked for. The problems are solved as map problems and the solutions are submitted to the director at a designated time before the exercise. The director examines all of the solutions and selects two, one for each side, which he thinks would lead to interesting and instructive situations, and designates the authors of these solutions as the commanders. By this method the director can give the maneuver the form which he desires without detracting from the initiative of the commanders and gains in advance an insight into the intentions of both; he may be able to carry the maneuver through some preliminary steps at once and thus gain time.

All of the participants are, in this way, made familiar with the problem, the interest in it is more general, and fewer explanations are required. This method can be used to advantage only when the initial problems for both sides are good map problems; it has been successfully employed in the Army Staff College and in the post graduate schools of some posts.

A commander can give the director a clear idea of his dispositions by means of a sketch. Sketches are useful even when (as is usually the case) they show no topography and are not drawn to scale, but merely show distances, intervals and the strength of units by means of figures. If the commander has tracing paper or thin typewriter paper, he can place it on the maneuver map or on his guide map and draw an accurate representation of the position of his troops, trenches, etc. Drawings of this kind greatly facilitate the work of the director, diminishing the number of notes required, and draw attention to details which might otherwise be overlooked.

ACCESORIES

The room used by the director should communicate with another, which should be well lighted and provided with chairs, tables, and writing materials where officers who are not engaged at the map can smoke, talk, read, or write at their convenience. The selection of a room opening only into a hall—perhaps cold and ill lighted—where officers have to await their turns at the map, will only cause map maneuvers to be regarded as a hardship and bring them into disfavor.

The task of seeing that the proper maneuver map is laid out, and that small scale maps, scales, blocks, etc., are provided, will in most cases devolve upon the director; he should also see that two or three pads of message blanks and sufficient paper for notes, sketches, and orders are at hand. The Field Service

Regulations, and the drill regulations of the different arms should be conveniently accessible.

DIRECTOR'S ASSISTANT

It is believed that exercises in minor tactics will in most cases proceed more smoothly and rapidly, and that better results will be attained if only one maneuver map is used, and the director keeps his own notes, dispensing with an assistant. If, however, an assistant can be found who will follow the exercise attentively, jot down quietly the necessary notes without being told to do so, measure distances marched, compute road spaces—time necessary for deployments, etc., and who will be always ready with needed information, he will contribute greatly to the success of the maneuver and lighten the work of the director.

But if it is necessary to tell the assistant what he should take down, or if when asked for certain data—as, for instance, "When did the Blue cavalry reach Kickapoo?"—he is unable to answer without a prolonged search through his notes and the making of new computations, it becomes apparent that the director could do better without him. A communicative assistant who becomes so interested in the exercise that he cannot refrain from seeking to exchange views with the director and the commanders is not desirable.

In complicated maneuvers involving large bodies of troops two assistants are sometimes used, one keeping notes of the Blue force and the other of the Red. But nothing is gained by the division of labor unless the assistants work smoothly and quietly and without unnecessary conversation.

Notes in regard to features of the exercise which the director wishes to bring up in the discussion had best in any case be taken down by himself.

Duty as a director's assistant should be acceptable to young officers as it affords the best means of preparation for the duty of director.

DECISIONS

The director is the arbiter in all cases of doubt and his decisions admit of no appeal. The questions which he must decide are many and various. The imperfections of maps, even when they are of large scale, render the representation of the smallest details of military operations dependent, in a large measure, upon the imagination; in order to be able to carry out successfully such exercises as patrolling, the director must have a ready imagination and the power of describing vividly scenes which suggest themselves to him. His imagination must always be on the alert to interpret the map and supply its deficiencies. Thus a director may be heard to say, pointing to a blue line on the map: "The banks of this stream are steep and six feet high; the stream itself is swollen by recent rains; it is fordable but the current is swift and the bottom soft; you are delayed fifteen minutes, etc." The height and density of forests, the height of hedges, grass and standing crops, the condition of the ground as affected by the weather, etc., must often be decided by the director in the same way. When the problem involves the employment of larger bodies of troops, the smaller details fall into the background and the strain on the imagination diminishes. In handling forces so large that the element of personal leadership of the commander is lost, and orders and messages are written, the work done in the map maneuver does not differ greatly from that done at the headquarters of a commander in the field.

The most frequent decisions are in regard to the rates at which troops march. The rate of march of

infantry or mixed troops is ordinarily taken at eighty yards per minute under favorable circumstances, when computed for considerable distances,—this rate makes allowance for the usual halts. When considering the rate for short distances, as in deployments, this rate is taken at eighty-eight yards per minute. The time, in minutes, required for the deployment of a column of infantry or mixed troops, is determined by dividing the length of the column in yards by eighty-eight. Infantry may increase the rate of march for short distances by "stepping out" (for instance when going into action) to 110 yards per minute. Double time is little used.

The rates of march of cavalry and field artillery are:—walk 110 yards, trot 220 yards, and gallop 330 yards. The rate of movement of staff officers and well mounted messengers in carrying "urgent" messages and orders is taken at 440 yards per minute and the rate of charging cavalry at 660 yards. The rate of march of cavalry over considerable distances including halts, the walk and trot alternating, is taken at 5 miles per hour or 146 yards per minute* All of the foregoing rates apply only to favorable conditions,—fresh troops, good roads, etc. Heat, steep slopes, mud, cultivated ground, standing crops, thick brush, and other unfavorable conditions reduce the rates of march, and must be taken into consideration by the director.

Slopes less than 3° do not affect the rate of march but for greater slopes suitable allowances should be made. Slopes greater than 5° affect the breathing and may reduce effectiveness of the fire of infantry if brought into action immediately afterward. Very short slopes are not taken into consideration.

Questions of visibility arise frequently,—and the distance, intervening obstacles, weather, state of the

*The rates given are intended merely as a guide; they should be modified whenever by doing so real conditions can be approached more closely.

atmosphere, and the size, position, and motion of the object must be taken into consideration. It does not follow that a patrol has been seen because it has reaced the top of a hill within sight of the enemy, for this would happen only if the patrol were careless.

In deciding questions of visibility it would be well to keep in mind the general rules to be found in Par. 75 of the Small Arms Firing Manual (1909).

The results of hostile contact must be decided by the director according to his judgment based on consideration of the circumstances of the case. Decisions on the results of hostile contact will ordinarily be of one or more of the following classes:

1. That troops are not to advance for a stated period.

2. That they are not to advance at all unless adequately reinforced.

3. That they must retire to a designated position.

4. That they cannot be used offensively for a stated period.

Losses are estimated by the director in accordance with his judgment, based on his experience and study of modern wars. In most cases the estimate of losses need not be stated and is taken into consideration only in determining their probable effect on the conduct of the troops sustaining them.

A study of "The Rifle in War" by Captain Eames, Pars. 171—188 Small Arms Firing Manual (1909), and of Pars. 17—20 Proposed Regulations for Field Maneuvers (1908) will be of assistance to officers in preparing them to be able to judge the effect of fire.

All decisions should be prompt and unequivocal. Mistakes are pardoned more easily than unreasonable slowness. "Slowness has always been the greatest enemy of the game" (Meckel). The poorest direc-

tor is not the one who makes the most mistakes, but rather one who decides slowly and hesitatingly, or whose decisions are not clear and definite.

The director sometimes states briefly the reasons on which his decisions are based, especially in cases of hostile contact. "The best results are attained when the decisions of the director carry conviction with them" (Meckel). But the limits of the time allotted for the exercise will ordinarily restrict discussions to the one held at the close of the exercise.

When officers having extended experience or special knowledge are present, the director will do well to avail himself of the opportunity to consult them in regard to difficult questions and may request them to deliver opinions at length to the participants. For instance, if an artillery officer is present he may be asked to give an opinion as to the effect of artillery fire in a particular case. But in all cases the director is the final arbiter and is not necessarily bound by such opinions.*

The director should avoid restricting the initiative of commanders. When a course of action is imposed on a commander which is not his own choice, he is likely to become careless of the results and lose interest in the exercise. The director generally has in view a special lesson which he wishes to illustrate by means of the maneuver, but this should not lead him to overrule the decisions of commanders in order to lead the exercise into a particular channel. He is sometimes compelled to interfere to prevent the occurrence of grotesque or impossible situations; but

*Major Immanuel recommends that important decisions be made by special umpires, other than the director; but later writers do not endorse this method. Meckel favors the use of dice for the same purpose. These methods would relieve the director of much responsibility and would, especially when the director is no older in service than the other participants, make his task lighter; but it is believed that more satisfactory results will generally be obtained when the director makes the decisions himself, and that officers of our army will not shrink from the responsibility involved.

these may usually be avoided by the exercise of tact in giving information and in rendering decisions.

PROGRESS OF THE MANEUVER

We will suppose that the commanders on both sides have given their orders, explained their intentions and gone out, leaving the director alone at the map. He examines the movements of each separate body of troops and determines which participant is the first to receive important information, likely to cause him to form a new decision (for example, he gains contact with the enemy). The director now computes the time at which the information is received (say 8 a.m.). It is usually best, especially for inexperienced directors, to move all troops on both sides up to the positions they will occupy at that time (8 a.m.) and take notes showing their positions at that hour, before calling in any one.

This gives him a new situation and the information to be given the commander may be affected by the new positions of supporting troops or of other bodies of the enemy than those with which contact has been gained. In this way the director is sure that he is keeping everything in order. With experience, however, the director learns to determine for himself which troops must be moved, and he does not move them unnecessarily.

The steps by which a two sided map maneuver proceeds are ordinarily as follows:

1. A commander* is called to the map.
2. The director imparts to him the military situation, including the time, the location of his troops, what he has seen or heard, the messages received, etc.

*The word "commander" is used here broadly to include not only the two commanders-in-chief, but all participants who may give orders, for example, commanders of detached bodies of cavalry, of advance guards, flank guards, etc.

3. The commander announces his decision, gives his orders, and retires.

4. The director decides upon the result of the orders and carries on the exercise until the situation changes to such an extent that one or more of the commanders will probably form new decisions. One of these officers is called to the map and the same steps are repeated.

The more closely the dialogues between the director and the commanders are confined to the matters here stated, the more smoothly and rapidly will the exercise progress. If the commander does not clearly understand the situation as presented to him, or if the director does not fully understand the decisions and orders given, the necessary questions should be asked and answered.

In deciding upon the order in which officers should be called to the map, the director should keep in mind their supposed positions and the initiative properly belonging to each; for instance, in the case of a division whose advance guard has come in contact with an enemy, there will be company and battalion commanders at the head of the advance guard who must take action before they can receive orders from the advance guard commander; and the advance guard commander must usually take action before he can obtain orders from the division commander. The action of subordinates in such cases may not always be approved of by the superior, but the director should carry out the order of the officer who properly acts first, and the superior is permitted to modify such dispositions later, if he desires to do so, by means of such orders as could actually be issued.

If, in the initial situation, one or both of the forces is supposed to be in column, the commander may be permitted or required to give the order of march. He usually does this after leaving the ma-

neuver map by making a drawing of an imaginary straight road and drawing his troops on it, showing in letters and figures the strength of each part of his force and the distances between them, the strength and intervals of flank guards, etc. This drawing is not necessarily made to scale nor to show topographical features; it is turned in to the director or to the assistant when the commander comes to the map again and becomes a part of the records. If a force is occupying a defensive position, a position in readiness, or is in camp or bivouac, its commander is usually required to make an outline tracing either from the maneuver map or from his guide map (using tracing paper or thin typewriter paper) and draw his troops on it in the positions he selects for them. His position is usually fixed approximately by the problem, as, for instance, "You are in command of a regiment of cavalry which is in bivouac on Seminary Ridge in the vicinity of the Lutheran Seminary with outposts along Willoughby Run," etc., but the details of the position are usually left to the commander. The drawings and tracings serve to make the situation more definite and to compel attention to details which might otherwise be overlooked.

If the commander called in is one who has been called in before, the information which he is supposed to have received (from observation, messages, reports, etc.) since he left the map should be imparted to him in the order in which he is supposed to have received it, by means of a continuous narrative of events. The situation is developed continuously without breaks or jumps. The commander may interpose orders whenever he thinks the situation requires them.

It is generally preferable to avoid asking commanders the questions, "What do you decide to do?"

or "What orders do you give?" for these questions might be taken as admonitions that new decisions or orders are expected. Orders should be given without prompting and should be the natural outcome of the situations presented. However, the director will prompt inexperienced commanders when it appears advisable to assist them, and will prompt others, if necessary, rather than permit the exercise to lag and become tedious. After a degree of experience has been acquired, the director may note the time consumed by the commanders in forming decisions and giving orders, and add this time to that required for the execution of the orders given, in determining the total time consumed by the movement. The director can take the time readily by starting a stop watch immediately after communicating the situation and stopping it when the order has been given.

If the director does not think the decision or order to be a good one under the circumstances, he should avoid betraying his opinion at the time. Faulty dispositions are best shown to be such by their results, and the director should, as a rule, reserve his opinions for the discussion.

If the commander expresses an intention to issue a written order or send a written message, the order or message is not ordinarily written while at the map; its substance is stated verbally and taken down by the director or the assistant, but it should be actually written as soon as practicable and handed to the director. "Such written work, done in the hurry and excitement of the game, is more useful and instructive than preliminary work done at home with plenty of time. We should require it often" (V. Litzmann).

When the opposing forces are started a considerable distance apart, time can be saved by using only the guide map during the preliminary movements,

taking up the large scale maneuver map and the blocks when the forces come into contact.

A commander sometimes states his intentions and wishes in great detail,—giving not only his orders but an extended description of the manner in which he wishes them carried out. In the case of small bodies which the commander is supposed to lead personally, this may be permitted to a reasonable extent; but in the case of troops removed from his personal supervision, it must be kept in mind that they are not animated by his individual intelligence. He must communicate to the director the orders he gives them and the director will decide the time at which the order could reach them and the manner in which the order is complied with. The order must be brief, clear and definite or it will fail to accomplish the object for which it is intended.

It is objectionable to question commanders as to the manner in which their orders are to be carried out. The director should draw upon his own experience and general information and—when necessary—on his imagination for aid in carrying on the exercise. For instance, on receiving a commander's order, he may reply,—"Your troops deployed and moved forward at 9.40 A. M. as you ordered, but on reaching the position where I place this block they received a heavy rifle fire from the railroad cut here in your front and from this hill on your left. The enemy appeared to occupy a continuous line from this point to this, but you did not see any intrenchments. The suddenness and intensity of the fire caused your line to fall back in some confusion, though with slight loss, to the cover of the woods here. The movement occupied twenty minutes and you have used the next ten minutes in restoring order in your ranks. It is now 10.10 A.M.," etc., etc.

It often happens that when a commander returns

to the map he finds, to his disappointment, that orders previously given have been imperfectly obeyed and that his intentions have not been fully carried out. At such times there is a temptation to make protests and enter into explanations which are likely to consume a great deal of time. Of course the director will consider that such protests and explanations are made in good faith and do not result from a desire to issue what are sometimes called "ex post facto" orders,—that the intentions stated have been actually communicated to him and are not such as were completely formed only after the commander had left the map. Nevertheless, it is usually a mistake to attempt to change the course of the exercise in consequence of such protests. The commander's proper remedy is to avoid such mishaps by stating his intentions and giving his orders so clearly and decidedly that they cannot be misunderstood. If he finds it difficult to do this, he should remember that it will be still more difficult when commanding troops in the field and that the effort to overcome this difficulty is beneficial to himself.

There is this notable difference between the exercise of command in a map maneuver and the exercise of command in the field, that in the map maneuver the commander can not change his mind till the situation changes. In the field a commander may form a decision and issue orders pursuant to it and then, upon more mature reflection and without external cause, alter his decision and countermand his orders. Map maneuvers offer no opportunity for this and it is not desirable that they should do so.

It sometimes happens that a director, after learning a commander's intentions and receiving his orders, calls him to the map again before these orders have been fully complied with, for the purpose of imparting to him some information which is of only

minor importance and not of a nature likely to cause him to alter his decision. In such cases the commander can only reiterate the desire that his orders be carried out; and it becomes apparent that it was only a waste of time to recall him.

The director's skill and tact will be called into play in deciding how far the exercise may be carried, after hearing the intentions and orders of the opposing commanders. If he carries it forward only short intervals before recalling the commanders, the maneuver progresses slowly and there is danger of its becoming tedious. If he carries it further he must at times, mentally personate one or more of the commanders and act for them in accordance with the intentions which they have expressed. Of course this is a fruitful source of differences of opinion, as the commander may claim that he would have acted differently if he had been allowed to act for himself. These difficulties are only to be avoided through care on the part of the director in learning the intentions of the commanders, and a degree of fairness on their part, which will be shown by a willingness to admit that they might have acted as the director has done.

The time at which the situation will have changed sufficiently to make it advisable to communicate the changed conditions to the officers concerned should at first be determined by measurements, computations and study. Practice and experience will give facility and rapidity in this work, and the director will learn to estimate time and space without considerable errors. It is important that the movements of troops be developed in detail and in an orderly way without losing the sequence of events or omitting any troops from consideration, but the exact periods of time consumed are of less importance.

The director's skill and good judgment will also be shown by hurrying over movements which are in-

decisive or uninstructive, and in dwelling upon those from which valuable lessons may be learned. Interesting situations should be fully shown with blocks to as many officers as practicable, consistently with the requirements of the maneuver. Sometimes partial discussions of such situations take place, but ordinarily the limitations of time will restrict discussions to the close of the exercise.

If the object of the exercise is to illustrate the work of cavalry, the cavalry operations will be considered in detail; but it will not be desirable to make every exercise a special study of cavalry operations and, in order to reach other phases of the maneuver in the allotted time, it will often be necessary to pass over the work of the cavalry rapidly.

The first stages of contact between the cavalry detachments of the opposing forces are often interesting. It may be that one cavalry commander has his troops dispersed and out of hand and that his antagonist can break through and secure important results. But if it appears that neither cavalry can make headway against the other or that the cavalry action will have but little influence on the course of the maneuver, the remaining forces may be brought at once to a position in which important decisions are required of their commanders. A proper allowance of maneuver time should, of course, be made for operations thus passed over, though the director may dispose of them in a few minutes; and the commanders should be furnished such information as they would be likely to obtain during the operations omitted.

It is not necessary to follow the course of every patrol sent out, though those likely to obtain important information should be followed, not only with a view to ascertaining the information which they will

obtain, but also to fix the time when this information will be received by the commander.

As many members of each party are called to the map at one time as can be done consistently with the requirements of the situation. This is done in order to enable as many officers as possible to derive instruction from the exercise. However, when important information is given to one member of a party and cannot properly be communicated to the others until a later stage of the exercise (when the information could reach them by the means of communication supposed to be employed) this officer writes the information given him on a message blank and gives it to the director, who calculates the time required for it to reach the officer to whom it is addressed and, at the proper time, delivers it to him. A message which is not likely to cause the officer to whom it is addressed to form a new decision may be handed to him at once and there is no need of computing the time of its receipt.

Maneuvers in grand tactics (called by Meckel "the great war game" and by Von Litzmann "the game for experts") are conducted in practically the the same way as maneuvers in minor tactics; maps of somewhat smaller scale and representing larger tracts of country are used, larger forces are employed, minor details are given less consideration and as a rule only the older and more experienced officers take part.

USE OF BLOCKS

The blocks representing troops are, as a rule, handled only by the director. In some cases, however, commanders may be instructed to place blocks to show the disposition of their troops,—for instance, in the case of an outpost or in the occupation of a defensive position, where the commander has ample

time to post his troops as he wishes. But the ordinary method in such cases is to require the commander to make a sketch or tracing showing his dispositions.

Directors differ greatly in their modes of using the blocks (or other means of representing troops). They are not indispensable—map maneuvers can be carried on without them. But a skillful employment of blocks will contribute greatly to the success of an exercise. By their use the director can illustrate a situation quickly and with few words—saving time and trouble and giving the commander a clearer view of the situation than could be done without them.

The blocks will also aid the director's memory, for when a situation has been illustrated by blocks a more vivid and lasting impression is produced by it on the mind. A liberal use of blocks makes the exercise more definite and insures attention to important details which might otherwise be overlooked.

The blocks themselves present valuable object lessons and their use will insure correct ideas being formed in regard to the space occupied on the map by the various organizations in different formations.

The method generally used is to place on the map blocks representing all of the troops of the party at the map and only such troops of the other party as are supposed to be seen.

Some directors use blocks only occasionally and incidentally, to indicate the location of troops which they are describing at the time. The blocks are removed as soon as this purpose has been accomplished. The director relies on his memory--assisted by pencil notes—to carry the troops. In this way the whole of the map can be shown to the commanders, and exercises can be carried on more rapidly.

But until a degree of experience has been acquired, directors may find it preferable to represent

on the map all the troops employed and to keep these representations on the map throughout the exercise. It is then necessary to cover up with a newspaper or the top of a card board box the blocks representing troops hostile to the party at the map, excepting such as are supposed to be seen by them. There can be no reasonable objection to covering parts of the map representing ground that could not be seen from the supposed position of the commander at the map, for the map is to be regarded—not as a map—but as the maneuver ground. When a part of the map is covered, care should be taken to cover the greater part of it, in order to avoid disclosing the location of the troops covered. The realism of the exercise is heightened by covering parts of the map showing ground which would not be visible to the commanders if they were actually on the ground with the troops, and such parts of the map are sometimes covered merely for this purpose.

Representing all troops with blocks will prevent many of the mistakes which beginners sometimes fall into, such as ordering different bodies of troops to march in such a manner that two or more must occupy the same space at the same time, ordering columns to cross each other's lines of march, etc., and certain tactical lessons are inculcated. But these lessons need not be repeated indefinitely, and, in the case of officers who are familiar with the space and time involved in the handling of troops, the exact manner of representing troops on the map decreases in importance. With practice the director can learn to remove blocks from the map without losing track of the troops which they represent; and, when all the participants are familiar with map maneuvers, a column may be sufficiently represented by placing a pin to show the location of its leading element, a battery or a battalion may be shown by placing on the map a

scrap of paper, a button, a piece of a broken match, etc.

HOW FAR CARRIED

After contact has been gained between the opposing forces at several points it becomes more difficult for the director to carry on the exercise in a plausible manner and with due regard for the wishes of all of the participants who would be concerned. For this reason some authorities recommend discontinuing the maneuver as soon as the greater part of the troops on both sides are committed to an engagement. "For, while during the advance and the deployment the actions of only a few persons (the commanders) need be considered," says Lt. Col. v. Zimmerman, "with the opening of an engagement the actions of a great number of subordinates, from lieutenants to squad leaders, have to be taken into account, and this makes the conduct of the game and a consideration of details impossible." But combats between small forces—not larger than regiments—can be carried through very well. And engagements between larger forces (brigades and divisions) can be carried on by "playing open" (with all participants at the map).

The difficulty of conducting the engagements of large forces can be greatly reduced by limiting the number of the participants, restricting them to the higher grades and permitting them to give orders no more in detail than is usually done by officers of their grades. For instance, in mixed brigades the officers assigned to commands would be the brigade commander, the regimental commanders and the commander of the cavalry; the commander of the leading regiment might command the advance guard until its functions were terminated, the commander of the next regiment might also command the artil-

lery and the brigade commander might also command the last regiment and the reserve. By assigning no officers to command battalions or smaller units and by permitting the participants to decide only such questions as properly fall to the province of the brigade, regimental, artillery and cavalry commanders, the director may keep the control of the execution of all details in his own hands and greatly simplify the conduct of the exercise.*

The maneuver should certainly be carried far enough to illustrate the tactical lessons which the director has in view and to show the results of the measures adopted by the commanders. But it is not always necessary to carry engagements through to accomplish this. For instance, if the exercise is designed to illustrate the reconnaissance preceding serious contact, it may be terminated at the preliminary stage of the engagement and the discussion be restricted to the effectiveness of the measures adopted by both sides for gaining information. Or the exercise may be started with a situation in which the advance guards of the opposing forces are in contact; each commander is given the information which he probably would have obtained up to that time; the advance guard action may be followed out; the artillery be brought into action and the orders given for the employment of the main bodies; the exercise may be terminated with a discussion of the preliminary stages of the combat. The final stages of a combat or the breaking off of an engagement can be illustrated in similar ways. Two or three situations well illustrated and thoroughly discussed are better than a long series of events run over so hastily that they do not leave any complete picture in the mind.

*Immanual, Litzmann, and Oberlindober each give examples of engagements between mixed brigades being carried through to a decision. And in Von Verdy's classic "Beitrag zu Kriegspiel" one of the forces is defeated and retires from the field.

PLAYING OPEN

When the time allotted to the exercise has nearly expired and most of the troops on both sides have been drawn into the engagement or committed to definite courses of action, the director usually calls both parties to the map and the exercise is brought to a conclusion quickly, the commanders giving their orders in the presence of each other and the director developing the situation rapidly in accordance with them.

DURATION

A map maneuver should not, as a rule, last over three hours; its real limit is the endurance of the director. When he becomes fatigued the exercise is likely to drag and become unprofitable.

SPECTATORS

Spectators will show tact and consideration by refraining from addressing questions or remarks to the director during the exercise. Interruptions of this kind delay the exercise greatly and may prevent its being brought to a satisfactory conclusion. Conversation among spectators which is loud enough to be heard by commanders sometimes divulges information which should not be given them, and is otherwise a source of annoyance.

DISCUSSION

All maneuvers should be followed by a discussion. The director should state the strength and mission of each of the opposing forces, if they have not already become known to all, and should make such an explanation of the situation at the beginning of the exercise as may be necessary to make clear the lessons to be learned from it. He then recapitulates briefly the events of the maneuver, and comments on its salient features, —dwelling chiefly on the most in-

structive situations presented and the most important decisions formed.

He should not leave the commanders with the impression that he regards their dispositions as the best possible when, as a matter of fact, he thinks them faulty; on the other hand he should avoid harsh criticism. He will ordinarily avoid saying, for instance, "Captain X made a mistake in failing to attack." Such expressions as "If Captain X had attacked promptly the results would have been more favorable in this case," or, "Under the circumstances I believe that an attack was advisable," etc., do not give offense, and emphasize tactical lessons sufficiently. In most cases the commanders have already seen the unfavorable results of their bad judgment or oversight and there is no need for the director to harp on them.

It often happens that the maneuver cannot be brought to a satisfactory completion in the time allotted. It should, nevertheless, be closed with a discussion as stated above.

If time permits, the commanders are asked to explain the reasons for their decisions, but the discussion should never be allowed to turn into a lengthy argument over a point which conveys no tactical lesson or which does not interest any considerable number of the participants. The director should retain control over the discussion as he has done over the maneuver, and should keep in mind that practical military instruction is the chief object of both.

If there are experienced officers present as spectators, who have followed the exercise with interest, they may be invited, during the discussion, to make comments; their remarks are often a source of pleasure and profit to all the participants.

TWO MAPS

It sometimes happens that no guide maps can be obtained and that several copies of the maneuver map are available. In this case each party may be provided with a copy of the large scale map, and assigned to separate rooms, or to opposite ends of one large room with a screen between them. The maneuver is carried on simultaneously on both maps. Both parties remain continuously at their maps and may keep on them blocks representing all of their own troops and of bodies of hostile troops whose location is known. The director must frequently pass from one map to the other. The commanders are sometimes required to write their decisions, orders and intentions and hand them to the director when he visits the map; sometimes they are communicated to him orally. The director, after obtaining the orders, etc., overlooks the map, makes needful decisions as to rates of march, results of hostile contact, gives suitable information of the enemy and carries the exercise on until it becomes necessary for him to consult the other party. Great care is necessary to keep the situations shown on both maps consistent with each other. It is sometimes discovered that troops of both parties have occupied the same ground, making it necessary to repeat certain movements—giving additional or different information. This method works very well during the early stages of a maneuver in which the opposing forces are not in contact at the outset, but it is usually advisable to conclude the exercise entirely on one map.

The protracted study of a large scale map permitted by this method—especially of portions of it not supposed to have been reached by the troops employed—does not approximate the conditions of warfare, for the commanders act with a more com-

plete knowledge of the terrain than they would ever have in war.

This method is in common use in the French army.

THREE MAPS

A method which was formerly very common, but now little used in tactical exercises, consists in giving each party and the director separate rooms, large scale maneuver maps and sets of blocks and scales. One large room may be used, separating the three maps by screens. The director places on his map blocks representing all troops on both sides and keeps them on his map throughout the exercise. The orders and intentions of the commanders are ordinarily written and sent to the director by messengers; the decisions and information furnished by the director are sent to the commanders in the same way. But in some cases commanders are called to the director's map to receive information and give orders orally; portions of the director's map occupied by hostile troops not supposed to be visible are then concealed by a screen. Sometimes there are assistants to the director, one of whom visits the Red room, the other the Blues, to obtain orders, convey information, move the blocks and make records; and these assistants may be authorized to make certain decisions—for instance, in regard to rates of march.

The three map method is the one commonly used in England.

Captain E. Dubois, of the French army, recommends giving each commander a plate of ground glass which he lays upon the maneuver map and draws his troops on it with colored pencils. The glass plates are then sent to the director who places both plates on his map, one above the other, and can thus see the entire situation. A modification of this

method has been in use for several years at our Naval War College and has recently been tried in our Army War College with satisfactory results. Sheets of transparent celluloid are used instead of the ground glass recommended by Captain Dubois.

The objections to the three map method are that the continuous use of large scale maps by the commanders does not simulate war conditions, the exercise is carried on slowly, more writing is required, and the commanders are not kept in as close touch with the director as is desirable in tactical exercises.

The three map method is, however, well adapted to siege operations, to the naval war game, and to strategic maneuvers.

SIEGE MANEUVERS

Map maneuvers have long been known to be specially well adapted to problems in the attack and defense of fortified positions. A work on this subject entitled "Directions for the Fortress War Game," by Major Neumann, was published at Berlin in 1872, and in 1874 a work on the same subject by Von Makowiczka was published at Vienna. Numerous works on the same subject have appeared in recent years, among which may be mentioned those by Colonel Kunde (1899), by Captain Krisak (1901), by Major Schroeter (1904), by Major Schwarte (1905), by Scharr (1905), by Frobenius (1906), by Von Brunner (1906), and by Fritsch (1907).

The war game maps especially suited to siege operations are "North Front of Paris," "Sedan" and "Toul—Verdun;" all published by Voss, Berlin.

NAVAL WAR GAME

The naval war game is conducted at the Naval War College at Washington as follows: —the officers solving different portions of the problem are isolated

from each other when they would actually be so separated in actual service, and all messages, orders, etc., are forwarded in writing through the umpire, who holds them for a length of time corresponding to the time which it would take to transmit the message in actual service. Each map used is covered with large sheets of celluloid, the sheets being oriented by means of reference marks. After each move the change on each individual map is noted on a small piece of celluloid which is divided into four squares of 4 inches each; all of these "transfer sheets" are carried to the umpire, who plots all moves on his sheet. After this has been done, those solving the problem may erase their work as they see fit, for all plottings made by the umpire are kept as the record of the game. In order to keep this record clean, the umpire places his work on as many sheets as he requires, giving to each a number for the purpose of identification. At the conclusion of the game a draftsman plots the principal moves from the umpire's report, and this forms the permanent record.

The sides are divided into sections, the principle governing the division being that officers commanding squadrons separated by considerable distances, such that a communication that would have to be carried on by means of a chain of wireless messages, or by means of repeated cablegrams, are kept in separate rooms and communicate with each other only by means of messages. These are written as a telegram would be written, and a copy is sent to the umpire, who also receives the copy intended for the officer to whom the message is addressed. The officer sending the message makes three copies—two whites and one yellow—the yellow leaf he keeps as his retained copy; both of the white sheets are sent in to the umpire, one being retained on the umpire's files and the other being sent to the officer to whom it is addressed.

The umpire notes the time at which this message would probably be received in service; it is then placed on a file and at the proper time is taken off and sent to the officer to whom it is addressed. The celluloid sheets used have marked on them squares about four inches on a side. The sheets are tacked fast to the map by the chief umpire before the game begins, so that all orient. Each move is plotted on the celluloid sheets and sent in to the chief umpire, who makes tracings of them on his celluloid sheets. The umpire also has numerous small sheets of celluloid which contain four, six or eight squares. In case of close contact, or when ships arrive in sight of each other, the chief umpire takes off on these small sheets a tracing showing the position of the ships which are in sight of each other and sends these to the respective sides for their information.

STRATEGIC MANEUVERS

Strategic map maneuvers are intended to give practice in such work as, in war, would fall to general staff officers. The organization and concentration of armies, the establishment of lines of communications, the service in rear of an army and on the lines of communications, the use of railway and telegraph lines, the service of information,—as well as orders for the movements of troops, cantonments and bivouacs, dispositions for battle, lines of fortifications, the keeping of records and the preparation of reports, etc., are taken up. Most of the work, in these exercises, is done by the participants at their homes. Meetings are held only for the purposes of discussion, giving important information, or announcing important decisions.

No attempt is made to conclude an exercise at one sitting, but a campaign is carried on continuously for several days during such hours as are available.

Small scale maps of large areas are used (1:100,000 in Germany, but our Geological Survey maps answer very well) and at least three maps of the entire theater of operations are required,—one of which is used by the director and one by each of the parties. An umpire may be detailed for each party, to make needful decisions in regard to rates of march, etc., and keep the director constantly informed of all movements of the party to which he has been assigned. Blocks may be placed on the director's map representing all troops employed on both sides. Commanders are not permitted to see this map until the final discussion.

Meetings for discussions are occasionally held by each party separately, and these usually result in fresh tasks being assigned to the subordinate commanders. There should be a sufficient number of officers in each party to admit of a chief of staff being assigned to each commander-in-chief, an officer to command the communications, and at least one officer for each body of detached troops. If possible each infantry division and cavalry regiment should have a commander. The work done (orders, reports, etc.) is in writing; the written work of each party should be collected by the chief of staff and arrangements should be made to have this work criticised. If the commanders-in-chief are well instructed officers of high rank, they will criticise the work of members of their own parties. The value of strategic map maneuvers as a means of instruction depends to a great extent on the discussion of the written work.

"The most important and most delicate duty of the director is the communication of information of the enemy. It is the most important because operations depend upon this information, and it is the most delicate because it is very difficult to give just the right measure of information and no more. One of the

most interesting features of the strategic game is the uncertainty which prevails as to the enemy's movements,—actual war conditions being simulated in this respect as much as possible.

Therefore much care must be exercised in giving information of the enemy; but the measures taken for reconnaissance by both parties must be given due consideration. The more experience the director has had in high staff positions in war, the more familiar he will be with the peculiarities of messages and other sources of information, and the better will he be able to hit on the right amount and kind of information to be given, and to mix correct, inaccurate, incomplete, and false information together in proper proportions. He should not, however, restrict the freedom of commanders in selecting means for obtaining desired information." (Anleitung zum Kriegsspiel, Meckel.)

Officers with the experience here spoken of are not numerous in our army but the experience of our Staff College shows that well instructed officers—such as the students of the Staff College—are able to conduct strategic map maneuvers well enough to make them interesting and profitable.

Information may be given in writing, in the form of messages and reports from cavalry commanders, patrols, spies, etc., or it may be given verbally,—the director at one time personating a prisoner, at another a spy who has come to make an oral report, etc.

Combats cannot be followed out in all their details; but their duration, results, and the situations growing out of them, must be decided by the director in accordance with his judgment based on the relative strength and situations of the forces engaged.

"The best time to bring a maneuver to a close is at the end of a day's operations or at the end of a

battle, since most of the written tasks are dependent on these periods'' (Meckel).

A war diary* should be kept by each party and Meckel recommends that each commander be required to submit a brief report of each day's operations and that the chiefs of staff be required to make reports of the entire campaign.

*See p. 313, "Duties of the General Staff", Von Schellendorf, 4th Edition, 1905, British translation.

CHAPTER IV

PROBLEMS

PRELIMINARY EXERCISES

No. 1. A column of mixed troops is marching south on the Kickapoo-Atkinson-Frenchman road. At 10 A.M. its commander, who is at the head of the main body, has reached the bend of the road 300 yards south of Kickapoo Hill; at the same moment a mounted messenger starts from Frenchman with an important message for him; when and where does he receive it?

See page 52. A scale of minutes of march for "infantry or mixed troops" is laid along the road with one division opposite the location of the commander; a scale of minutes for a "mounted messenger" is applied to the road beginning at Frenchman and a small (estimated) deduction is made on account of hills; and it is seen that at the end of ten minutes, or at 10:10 A.M., the commander and the messenger will meet near Section Lane.

No. 2. At 10:32 A.M., the commander mentioned in the preceding problem reaches the Millwood Road: at this moment an important message is sent to him by a mounted man from the cross-roads 200 yards west of T. Meyers (southwest of Kickapoo). When and where is it received?

The solution is similar to that of the first problem—only, in this case, the messenger overtakes the commander instead of meeting him.

No. 3. Represent fully on the map a Blue column composed of 2 regiments of infantry,

2 batteries, and 1 squadron of cavalry, (6, 2, 4) marching in hostile territory northward on the Kasten-Frenchman-Kickapoo road with the leading infantry element opposite Dolman. Red cavalry has been seen at Kickapoo. Show in detail the same column 5 minutes later. How much time will this column require for deployment on the line of the Millwood Road? (See page 79.)

No. 4. A Blue force is taking up a defensive position along the north front of Leavenworth. A cavalry patrol reports seeing at 11 A.M. from Hancock Hill a column of Red troops on the Kasten-Frenchman-Atkinson road; that there was cavalry all the way from Gauss to Frenchman, infantry from Burns to Taylor, and a continuous column of infantry and artillery north of the Millwood road, the tail of which had just cleared Atkinson. The patrol was driven away before further details were noted. What is the strength of the Red column?

Solve by building it up with blocks or by applying to the road the units shown on the edge of the cardboard scale. (Plate 2).

No. 5. How long before the Red force mentioned in the preceding problem can occupy Atchison Hill with artillery?

No. 6. A Blue patrol is on Wagner Point watching a column of Red troops as they emerge from cover at Moore (on the Atchison Pike) move west, and disappear behind trees near Flint. The patrol commander wishes to note the time the various units require in passing a certain point. The column is composed of a squadron of cavalry in column of twos which passes the point at a gallop, followed by a battalion of artillery which passes it at a trot, and then by a regiment of infantry at quick time. What information does the director give him and how is it obtained?

The various units as shown on the edge of the card board scale (Plate 2) are applied to scales of minutes of march at the rates stated (Plate 3). The squadron is applied twice, because it is in column of twos, to the scale for "cavalry walk", as we have no scale for "cavalry gallop", remembering that the rate for the gallop is about three times that for the walk; or it may be applied to the scale of yards, (Plate 2) noting that 440 yards or $\frac{1}{4}$ mile is covered at a gallop in $1\frac{1}{3}$ minutes. The periods are, cavalry 3 minutes, artillery 6 minutes, and infantry 8 minutes.

No. 7 A Red company is falling back westward on the Millwood Road, after attacking unsuccessfully a Blue outpost at the edge of the wood east of L. Kern. The Blues have a machine gun on the Millwood Road at the edge of the wood. The Blue commander directs the machine gun to fire on the retreating Reds as they cross the Salt Creek bridge. If this is not practicable, the machine gun is to fire on them as soon as they are seen. What is the ruling of the director?

The chief obstruction is Hill 873, north of Sharp, which is about 800 yards from the machine gun. The elevation of the machine gun is 900 feet; the line of sight from it to hill 873 drops 30 feet in 800 yards; and as the line of sight is a straight line it must continue to fall at the same rate. The bridge is less than 800 yards from Hill 873 and is more than 30 feet lower; consequently it is sheltered from the machine gun. 800 yards west of Hill 873 the elevation of the line of sight will be 840 feet, at a point nearly opposite J. E. Daniels; a little further west the ground rises to an elevation of 840 feet; the line of sight will strike the ground on the Millwood Road a little east of the 840 contour. The director rules

that the Reds will be visible from the post of the machine gun when they reach J. E. Daniels.

ONE SIDE MANEUVERS

No. 1.* The director is 1st Lieutenant A, who is instructing the non-commissioned officers of his company. He has conducted several recitations in the Service of Security and Information and now wishes to test the familiarity of the class with this subject and their ability to apply intelligently what they have learned.

For this exercise the map maneuver table top (of soft wood, 4½ by 7½ feet) is stood on end on top of the trestles which ordinarily support it and is leaned against the wall in such a position that the light from two windows falls on it. The maneuver map (Leavenworth—Kickapoo, 12 inches to 1 mile) is fastened to it with thumb tacks. Lieutenant A stands in front of the map with a pointer in his hand; on a table near him he has a box of colored pins and card board blocks, a pad of message blanks and a copy of the Field Service Regulations. Of the class there are present:—1st Sergeant B, Q.M. Sergeant C, Sergeants D, E and F, Corporals G, H and I, and Privates K and L.

Lieutenant A represents with blocks on the map a regiment of Blue infantry in column, marching south on Grant Avenue and west on Metropolitan Avenue, the head of the support of the advance guard at the corner of 9th Street and Metropolitan Avenue.

Lieut. A: The 1st Blue Infantry has crossed the Rock Island Bridge and is advancing into Kansas, which is hostile territory, and has just reached the position shown by these blocks. Do you all under-

*This is Map Problem No. 1, Course in Tactics, Part I, Army School of the Line, 1909-10. Any good map problem can be expanded and discussed in this way.

stand the character of the ground about here as shown by the map?

(The class has recently completed a course of instruction in map reading but Lieutenant A points out the principal streams and hills which will enter into the problem and assures himself that all members of the class are reading the map correctly before going on.)

Lieut. A: It is 8 o'clock in the morning at this season of the year when the 1st Infantry reaches this position. The commander of the advance guard is at the head of the support, here, and has just given orders to Lieutenant X to take two noncommissioned officers and eight privates, who have been detailed from the leading company of the support, and go to the top of the hill, here, (South West hill) which he points out and which Lieutenant X can see over the top of the U. S. Penitentiary. Lieutenant X's orders are to watch the country that can be seen to the north and west from this hill, to cover the right flank, and to rejoin the advance guard, here, (24). The point where he is to rejoin is pointed out to him on a small scale map which he carries. You will notice that an officer is sent with this patrol; do you think that officers will usually be sent with such patrols?

Q. M. Sergt. C: There are only ten men in the patrol; I do not think that an officer would be sent with a party of that size.

Lieut. A: The size of the patrol is not the only thing to be considered. Lieutenant X is sent to an important point of observation on the flank of the column not only to see what can be seen from there but also to protect the column while it is passing. His mission is important enough to require an officer, but our regular regiments are always so stripped of officers in war that it is not likely that there will often be officers available to go with patrols of this

kind. For this reason our noncommissioned officers must learn to do the work and carry the responsibilities of officers—up to the command of a company. In our problem today it is supposed that there is an officer available and an officer, Lieutenant X, is sent. But any one of you may be sent in command of a patrol of this kind. Now, what route ought Lieutenant X to take?

1st Sergt. B: I think that the advance guard commander would tell him which way to go.

Lieut. A: I have given you all the instructions that he has and there was nothing about the route. Sergeant D, which way do you think he ought to go?

Sergt. D: I think he would go up the ravine to the north to the big creek there—

Lieut. A: Corral Creek.

Sergt. D: Yes, sir, and then go up the bed of the creek, keeping out of sight.

Lieut. A: Lieutenant X could keep his patrol concealed very well in that way—there is good cover in the bed of Corral Creek. The banks of the creek are from four to six feet high and there are bushes along the banks. Do any of you see any objection to this route?

Corpl. G: I don't think he could see much.

Lieut. A: I agree with you; and observation is more important than concealment here. Can anyone see another objection to it?

1st Sergt. B: If he goes in such a round about way he will not get to the hill very soon.

Lieut. A: Right. And I think he should get up there as soon as he can.

Corpl. H: I think he ought to go right along Metropolitan Avenue and take the road that leads off to the right near the railroad.

Lieut. A: At 64. Yes, that route would take him to the hill quicker than any other, because it is

the best road. But is there not an objection to this road?

1st Sergt. B: The advance party is already on it and Lieutenant X will not see anything that has not been seen by the advance party till he gets to the hill.

Sergt. E: He ought to take the road leading past the Penitentiary and to the cross roads at the foot of the hill (14).

Lieut. A: We will take the route suggested by Sergeant D. It runs along a low ridge all the way to the hill and gives a good view.

Sergt. E: I think that the patrol ought to search the Penitentiary before going past it.

Lieut. A: When Lieutenant X reaches the point where I place this blue pin (70) he sees a patrol from the advance party enter the Penitentiary. As his mission takes him beyond he leaves the searching of the Penitentiary to this patrol from the advance party. He has marched his patrol in column of twos to the northwest corner of the Penitentiary because the ground that far has been patrolled by the advance party. Private K, what formation do you think the patrol should take up after it passes the Penitentiary?

Pvt. K: Lieutenant X would send a noncommissioned officer and one private 50 yards ahead on the road and one man 50 yards out on each side. He would have 6 men with him and they would march in column of twos behind him.

Lieut. A: (representing the patrol in this formation with pins and a blue disc) Private L, do you think that this is a good way to march this patrol?

Pvt. L: Yes, sir, except that I would put one man 50 yards behind the main body and leave only 5 men with the lieutenant.

Lieut. A: Corporal I, what do you think about this?

Corpl. I: I think the lieutenant ought to be with the point—the Field Service Regulations say that he ought to be there.

Lieut. A: First Sergeant B, what do you think?

1st Sergt. B: I would not put any men out on the flanks because they could not see any more there than could be seen from the road and they would delay us because they could not go as fast out there as they could on the road.

Lieut. A: I agree with the First Sergeant that there would be no advantage in putting out flankers here. Sergeant C, do you think that Lieutenant X should go with the point?

Q.M. Sergt. C: No, sir, he could not see any more up there and he is going toward some woods that an enemy might be concealed in—laying for him.

Lieut. A: The rule in the Field Service Regulations (1905), "In small exploring patrols the commander should in most cases be in the lead" is not intended to cover all cases. We will arrange the patrol in this way (representing it with pins), this represents a noncommissioned officer and one private; here, 75 yards in rear of them, is Lieutenant X with one noncommissioned officer and six privates walking on both sides of the road with about ten yards distance between the men; here, about 75 yards further back is one man. The patrol marches in this formation to the cross roads here (14) and sees nothing of the enemy. It now enters the woods. Sergeant D, do you think that we should retain the same formation?

Sergt. D: I think that the lieutenant ought to go up to the front now, and that the distances ought to be shortened.

Lieut. A: Very good. Sergeant E, would you make any further change?

Sergt. E: I would put out flankers now unless the underbrush is so thick that men cannot march off of the trail.

Lieut. A: There is but little underbrush in this wood and flankers could march practically as fast as men on the trail; so we will put out a flanker about 50 yards on each flank and the distances of the point and rear man are reduced to 50 yards. Lieutenant X goes up to the point. Nothing is seen of the enemy in passing through the wood. Lieutenant X reaches the point where I place this pin (50 yards north of the letter "W" in "South West Hill"). Here he gets a view of the country to the north. (As an exercise in map reading some members of the class are called on to describe the country as Lieutenant X sees it.) Here where I place this red pin and yellow block (200 yards west of G) he sees about 20 hostile cavalrymen, and here (on the Atchison Pike between Gauss and Baker) he sees a somewhat larger body of cavalry; they are advancing at a walk. It is now 8:40 o'clock and it is five minutes since Lieutenant X last saw the column of his own regiment; at that time they were here (Lieutenant A moves the blocks representing the Blue regiment—the head of the main body to 64). Now what does Lieutenant X do?

Sergt. F: He ought to hide his men and watch the Red cavalry.

Corpl. G: He ought to send a message.

Lieut. A: You are both right; and as no one seems to disagree I will ask each of you to write the message that Lieutenant X should write.

Message blanks are distributed to all members of the class and each writes the message. A message which meets Lieutenant A's approval is as follows:

From Lieut. A's Patrol,
At South West Hill,
Date 21 Sept. 10 Hour 8:45 a.m. No. 1.
To Major A, Comdg. Advance Guard,

About 70 hostile cavalry at SALT CREEK village moving east at a walk on the ATCHISON Pike. I cannot see the Pike beyond SALT Creek. I remain here.

X, Lieut.

Lieut. A: How does Lieutenant X send his message?

Corpl. H: By one of the men who is with him and saw the enemy.

Lieut. A: Very good, but there are two men with him, a noncommissioned officer and a private; which one of them would you send?

(There is a difference of opinion in the class on this point and some members are of the opinion that both should be sent).

Lieut. A: Lieutenant X decides to send the noncommissioned officer as he believes that the noncommissioned officer will be more likely to find his way to the column quickly, deliver the message to the proper person, and give a clear account of what he has seen. He does not send both because he does not wish to deplete his patrol unnecessarily. If the message had to be carried a long distance through hostile territory, it would be better to send two men with it but that is not the case here. Lieutenant X now has nine men left; what disposition does he make of them on South West Hill?

Sergt. D: I think that two men ought to be sent to the north end of Government Hill (16) to see if the Red cavalry is coming by there.

Corpl. I: It seems to me that some men ought to be sent over on 1100 Foot Hill to take a look at the Atchison Pike west of Salt Creek. There may be some more Red troops following this cavalry.

Lieut. A: There would undoubtedly be advantages in sending men to these places; but does any one see objections to sending them? (No one in the class answers and Lieutenant A continues.)

Lieutenant X's most important duty now is to guard the trail along the Government Hill—South West Hill Ridge and prevent the enemy from passing him, because this ridge would give them a view of the Blue column. If Lieutenant X should send men as far away as you suggest he would lose control of them and could not use them in case he has a fight.

Corpl. I: I did not know that he expected to fight. The Field Service Regulations say that "the object of a patrol is not to fight but to obtain information"

Lieut. A: The Field Service Regulations can not give us rules to cover all cases. This patrol must cover the flank of the advance guard—perhaps of the main body also—and it may be compelled to fight to accomplish its mission. First Sergeant B, how would you arrange this patrol while in observation on South West Hill?

1st Sergt. B: I would put them under cover at or near the road fork (20) in such a position that they could use their rifles to the north and northeast. And I would put a lookout on the road to the northeast, about 200 yards out. Lieutenant X would stay at the north end of South West Hill and would keep one man with him but he should be near enough to his men to be able to give them orders.

Lieut. A: I will accept First Sergeant B's disposition but will send two men instead of one to this point (18) as a double sentry post, and I will post one man on the trail to the southwest at this point (about half way between 20 and the cemetery). The patrol has the appearance of being badly scattered as I have represented it on the map, but I would re-

gard it as tactically concentrated because all of the men are under Lieutenant X's control and can be used for a common object. On the other hand if some of them were sent to the north end of Government Hill and some of them sent to 1100 Foot Hill they would be tactically dispersed because they would be out of hand. By attempting to accomplish too much we might fail to accomplish anything; and this is a very common fault with our people.

At 8.50 A. M. one of the men posted here (18) signals "enemy in sight". Lieutenant X moves toward the main body of his patrol and a moment later sees 8 hostile cavalrymen here (at the words "Government Hill") on the trail coming toward him at a walk. They do not appear to have seen the Blues. Private K, what will Lieutenant X do now?

Pvt. K: I think he would just lay low till they got up to him and then capture them.

Lieut. A: Does everybody think that is a good plan? (The class generally agrees with Private K.) What do you take this hostile cavalry to be?

Pvt. K: I suppose it is a cavalry reconnoitering patrol.

Lieut. A: Does any one think differently?

Sergt. D: There seems to be a Red troop coming this way and this patrol may be the point or a flanking party from its advance guard.

Lieut. A: Suppose that it is the point and that you let them come up to you; is it not likely that by the time they reach you there will be more of them in sight?

Sergt. D: Yes, sir; may be the platoon that was seen at Salt Creek village will be coming up.

Lieut. A: And then while we are trying to capture the patrol we may be charged by a platoon. No, I think that Lieutenant X would assemble all of his men as quickly as he could and then open fire on

the Reds immediately. This will keep them at arm's length and prevent them from learning the strength of his patrol. We will say that this is what Lieutenant X does and that the Red cavalry falls back to the north—out of sight—here (toward 16). Several minutes pass and the Reds do not appear again. What do you think Lieutenant X should do now, Private L?

Pvt. L: I do not think that the Reds will try to come by that road again—they will think there is a strong force on it. I think they will go on the Atchison Pike and that Lieutenant X ought to go over to Atchison Cross and head them off.

Lieut. A: That would be exceeding his responsibility. No doubt there is another Blue party watching the Atchison Pike. But by this time the tail of the Blue main body has passed this corner (60). Do you not remember that Lieutenant X was ordered to rejoin the advance guard here (24)?

Pvt. L: He will have to start right away if he is going to catch up with them.

1st Sergt. B: The sound of the firing ought to bring a party of Blues up from the main body; but I do not think that Lieutenant X ought to leave South West hill till they come—at least not yet.

Lieut. A: I agree with the First Sergeant. Lieutenant X should have been relieved by a party from the main body by this time, but as it does not appear that this has been done he should continue to guard the flank of the column, since he is covering a good point of observation and the enemy has been seen here. He would leave it, however, by the time the tail of the main body reached this point (a little east of 56); he would then fall back to the southwest along the ridge and probably join the rear guard. Liutenant X fails to comply literally with his instructions in regard to rejoining the advance guard,

but, no doubt, he will be commended for taking this responsibility on his shoulders when the circumstances become known to his superiors.

It has probably become apparent to all of you that the work of Lieutenant X's patrol differs in some respects from that of the infantry patrols we have chiefly studied hitherto. This patrol is, in fact, a flank guard. I will ask First Sergeant B to read paragraphs 110, 111 and 112 of the Field Service Regulations, (1905).

After the reading Lieutenant A closes the exercise with some additional remarks in regard to the duties of flank guards and shows how these duties are illustrated by the operations of Lieutenant X's patrol.

> No. 2. A Blue battalion from Atchison has halted for the night at 2 P. M. near J. Aaron; it is in hostile territory and a Red cavalry patrol has recently been seen near Taylor. Show with blocks the Blue camp and outpost.

The director reconnoiters the outpost and camp with Red patrols; thus indicating posts of observation from which they can be overlooked. He also brings small parties of Reds by routes which are not observed to favorable points from which they can fire on the camp; and, later, attacks the Blue outpost with a Red battalion.

> No. 3. A troop of Blue cavalry has just crossed the Missouri river with instructions to disable the railroads in the vicinity of Atchison Cross. At 10 A. M. it has reached Merritt Hill and its commander has just received information that about 40 dismounted Red cavalrymen are in the railroad cut 250 yards northeast of Atchison Cross with their horses in the woods to the west of them. What is his decision and what orders does he give?

The director commands the Reds and gives appropriate information in regard to them.

No. 4. A troop of Blue cavalry in friendly territory has reached South West hill via the Zimmerman road, and has received information that a train of fifty impressed two-horse wagons, containing provisions which have been requisitioned in Leavenworth, is standing on Metropolitan Avenue south of the U. S. Penitentiary and is to start for Kickapoo (where there is a Red outpost) in one hour, escorted by one platoon of Red infantry and a squad of (12) Red cavalry. It is now 1 p.m. June 26—the atmosphere is hazy. The commanding officer of the Blue troops decides to attack the train. Show the manner in which he disposes his troops and explain the mode of attack contemplated.

No. 5. A Blue detachment, consisting of two regiments of infantry, one battalion F. A., one squadron of cavalry, one company of engineers and one field hospital, has just detrained at the Kickapoo station and is directed to cover the detrainment of other troops there. A Red force of all arms is crossing the Missouri River from the east at Fort Leavenworth, and Red cavalry has appeared on Hancock Hill. Show the disposition of the Blue detachment.

No. 6. A Blue independent infantry brigade, with troops of other arms attached has crossed the Missouri river and halted for the night at Fort Leavenworth, placing an outpost consisting of one regiment of infantry, one battery F. A., and one troop of cavalry (3, 1, 1) on the Sheridan Drive ridge. It is 2 p.m., May 6, and the weather is fair. Red troops of all arms are known to be at Easton. Show the disposition of the outpost. (Salt Creek and Plum Creek are serious obstacles).

No. 7. A Blue advance guard consisting of one infantry brigade with one battalion

F. A. and one squadron of cavalry (9, 3, 4) has reached Frenchman from the north. Its cavalry has occupied Sentinel Hill and reports a Red infantry regiment with one battery F. A. in position on Atchison Hill—the right flank at the railroad cut, the left on the spur north-west of Government Hill, and the battery on Atchison Hill. It is 10 a.m. on a clear summer day. The Blue force (a division) must occupy Leavenworth before 1 p.m. Give the decision and orders of the advance guard commander. (Salt Creek is a dry ravine about three feet deep.)

TWO SIDE MANEUVERS

No. 1

Detail:

Director, Captain A.
Commander, Blue, Captain B.
Assistants, Blue, Lieutenants C and D.
Commander, Red, Captain R.
Assistants, Red, Lieutenants X and Y.

All of the participants have been notified that the next exercise would be in cavalry patrolling.

The following problem, in writing, is sent to Captain B a half hour before the exercise.

General Situation:

A Blue detachment in friendly territory occupies Leavenworth. A Red detachment from Atchison has halted northwest of Kickapoo. The date is August 15th. Corral Creek, Salt Creek and Plum Creek are serious obstacles. The atmosphere is hazy.

Special Situation—**Blue:**

The outpost of the Blue detachment consists of one battalion of infantry and one troop of cavalry, and has orders to hold the

approximate line of Metropolitan Avenue and observe to the north as far as Kickapoo. You are in command of the outpost; at 2 p.m. your outpost is in position.

Required:

1. The arrangement of the outpost.
2. The number of cavalry patrols and the orders given them.

The situation is communicated to Captain R at the same time as follows:

General Situation:

A Blue detachment in friendly territory occupies Leavenworth. A Red detachment from Atchison has halted northwest of Kickapoo. The date is August 15th. Corral Creek, Salt Creek and Plum Creek are serious obstacles. The atmosphere is hazy.

Special Situation—Red:

The outpost of the Red detachment consists of one battalion of infantry with a machine gun platoon and two platoons (50) of cavalry. It has orders to hold the approximate line of the hills 858, 929 and 1000 and to reconnoiter through Fort Leavenworth and Frenchman. You are in command of the outpost and at 2 p.m. the outpost is in position.

Required:

1. The disposition of the outpost.
2. What cavalry patrols are sent out and what orders are given their commanders.

The director sees that the proper maneuver map is laid out and that the scales, blocks, message blanks, paper and pencil are provided. As the maneuver is a simple one he does not require an assistant. At the hour set for the exercise he calls the Blue party to the map.* Captain B reads the problem to his assis-

*In this exercise it is immaterial which party is called first.

tants and points out on the maneuver map the localities named; he then hands to the director a sheet of thin typewriter paper on which he has drawn a tracing showing the arrangement of the outpost. This tracing has been made from a four inch scale map in his possession, but only two localities on the map have been traced through—Atchison Cross and the corner of Grant and Metropolitan avenues; the outpost has been drawn on the tracing with a blue pencil. The director places the tracing on a four inch scale map, orienting it by means of the two reference points; and Captain B explains the dispositions of the outpost, pointing out the location of the various units on the twelve inch scale maneuver map. He has placed Company A on the north slope of Circus hill, Companies B and C on Prison hill and Company D on Avenue hill. He explains that Company A is to hold the line from the Missouri river to the first ravine west of Grant hill, inclusive; that Companies B and C hold the line from this ravine to the U. S. Penitentiary, inclusive; and that Company D holds the line from the U. S. Penitentiary west to include 20th street, communicating with the cavalry, which occupies the Government hill, South West Hill ridge, observing the Atchison Pike and the Barnes and Zimmerman roads. Company A places a picket on Grant hill and sends an infantry patrol to examine the Pope hill and Devin ridge woods; Companies B and C perform the functions both of a support and a reserve and place a detached post on Long Ridge. Captain B says that for the present his own position is on South West hill and that he will send out cavalry patrols from there.

Director: What cavalry patrols are sent out?

Capt. B: Two, of eight men each; one to examine the country east of Salt Creek, the other the country west of it.

Director: Please assign your assistants to the command of these patrols and give them their orders.

Capt. B: C, you will take eight mounted men who have already been ordered to report to you, and examine the roads between Salt Creek and the Missouri River; if you find no important hostile forces there you will push on as far as Kickapoo. Send messages here (to South West hill). D, you will take another patrol of the same size, reconnoiter the country west of Salt Creek and gain touch with the enemy. Send messages here.

Director: Mr. C, what steps do you take?

Lieut. C: I inspect my patrol and then move out at a trot to Atchison Cross and then take the road west of the target range. At the target butts I detach a non-commissioned officer and two men to follow Hancock Avenue, reconnoiter Fort Leavenworth and the road by the Prison Cemetery, and rejoin me on the Millwood Road. I move north from the railroad cut along the ridge and follow Sheridan's drive and the Millwood Road.

Director: What is your formation?

Lieut. C: There are two men about four hundred yards in front of me, one with me, and two about four hundred yards behind me. The McGuire—Sharp trail is watched when it can be seen from Sheridan's Drive; all of the men are cautioned to avoid exposing themselves to view from the west. I continue to move at a trot.

Director: What are your intentions, Mr. D?

Lieut. D: I will move along the trail to Government hill, then take the Atchison Pike to Frenchman and there turn north on the Kickapoo road. At the road fork south of Flint I send two men up Sentinel Hill to observe the country to the north and west, and rejoin me on the road. I ride at the head of my party; there are four men with me; three follow at

about three hundred yards and one follows one hundred yards further back.

Director: What gait do you take?

Lieut. D: Walk and trot.

Director: Do you send anyone on the Atchison Pike west of Frenchman?*

Lieut. D: At Frenchman I send three men west to the railroad. They will move through the railroad cut to the hollow north of T. Flint, then follow the depression parallel with the railroad and about one hundred yards northeast of it, keeping one man——

Director (*interrupting*): What orders do you give these men?†

Lieut. D: To go west to the railroad, turn north, and rejoin me near A. Daniels. I show the location of A. Daniels to the chief of the party on my pocket map.

The director now directs the Blue party to withdraw and requests Captain B to call the Red party to the map. Captain R reads the problem aloud, points out to his assistants the localities mentioned and turns in to the director a tracing showing the disposition of his outpost. One company, posted on the road where it crosses the stream between Hill 858 and L. A. Aaron, holds the line Hill 858—L. A. Aaron inclusive; one company, posted on the northwest slope of Hill 929, holds the line, L. A. Aaron, exclusive—Hill 929, inclusive; and one company, posted on the northwest slope of Hill 1000, holds the line Hill 929, exclusive—Missouri River. The reserve consists of one company, the machine gun platoon and one platoon of cavalry and is posted in the southeast angle of the wood 250 yards west of Hill 929.

*The director prompts Lieutenant D more than is desirable.

†Lieut. D cannot control every move of these men after they leave him; —besides, he could not see this depression from Frenchman, and he is taking more time than the director is willing to devote to this subject.

There are no pickets or sentinels in front of the line of the hills 858, 929, and 1000.

Capt. R's orders to the Red patrols are:—A detachment of the enemy is at Leavenworth. Our outpost will hold the line of the hills 858, 929, and 1000. I am ordered to reconnoiter through Fort Leavenworth and Frenchman. Lieutenant X, with a cavalry patrol of 12 men, will go through Frenchman; Lieutenant Y, with 12 cavalrymen, will go through Fort Leavenworth. Information of the enemy's strength, position, and intentions is important. Messages will reach me at Hill 929.

Lieutenant X states his intentions as follows,—I will take the Spencer—A. Daniels—Millwood road. At Taylor S. H. I turn south toward Frenchman. I will march at a trot in normal formation.

Director: What do you mean by "normal formation"?

Lieut. X: A noncommissioned officer and two privates constitute the point and keep 500 yards ahead of me. Two troopers are detailed as right flankers and two as left flankers,—they are to march 300 yards from the road and the same distance behind the point. The point and flankers gain their distances and intervals at a gallop. A rear guard of two men follows me at a distance of 500 yards.

Director: You reach A. Daniels without seeing anything of the enemy,—your attention is then called to the fact that nothing has been seen of your flankers since passing Plum Creek.

Lieut. X: I wait at A. Daniels for them to communicate with me.

Director: They come up to the Millwood Road ten minutes later.

Lieut. X: I will then go on.

Lieut. Y gives his intentions as follows,—I will take the Atkinson—Taylor S. H.—Millwood road to

Fort Leavenworth, moving at a trot and keeping all of my party on the road. Two troopers are sent ahead but they do not keep any fixed distance,—they gallop ahead till they come to a place giving a good view to the front and stop there till I signal them to go on. Lateral roads are observed by sending two troopers out on each till they come to a place giving a good view. They go out at a gallop but return at a trot. My rear is usually covered by some of these men catching up but I have no other rear guard.

The Red party now retires. It is apparent that the patrols of Lieuts. D and X will come in contact with each other, and the director studies their movements (particularly noting whether or not the two Blues sent to Sentinel Hill would have seen the Red patrols) and then calls Lieut. D.

Director: At 2.35 P. M. you have reached Burns without having seen or heard anything of the enemy. The two men sent to Sentinel Hill have rejoined you but have nothing to report. As you come upon the Burns ridge here where I have placed this blue pin you see two Red cavalrymen here, where I place this red pin (near Taylor on the road) coming toward you at a trot.

Lieut. D: I rein back partly behind the ridge and signal to my party to close up.

Director: The Reds continue to advance and you now see another, here—three in all.

Lieut D: I dismount my party by signals to fight on foot and take a position, under what cover I can find, on the Burns ridge. The horses are placed in the ravine south of the ridge, under cover east of the road.

Director: Your men are concealed by weeds. When you are in position the three Reds have passed Dolman. They do not appear to have seen you.

Lieut. D: I order the sights laid down and open fire at will.

Director. The Reds retire at a gallop. You see two or three more mounted Reds here, on the road near Taylor.

Lieut. D: I hold my ground and watch them.

Director. Please call Mr. X. (*To Lieut. X*). I will caution you to avoid saying anything to disclose your strength or position unnecessarily, as Mr. D, who is present, is your antagonist. You reach Taylor at 2.37 P.M. without having learned anything of the enemy. On reaching this point you hear firing to the south and as you come over the ridge you see your point retreating at a gallop. They report that they were fired on from the low ridge (here) which they point out to you. They saw no one.

Lieut. X: I examine the ridge attentively with my glasses. I also examine the road to the south and look especially for dust rising in the vicinity of Frenchman.

Director. You see nothing of the enemy and no dust.

Lieut. X: I signal to my flankers to come in.

Director. Nothing has been seen of your left flankers since you left the Millwood road. Your right flankers were seen near Moss some minutes ago but they are not now in sight.

Lieut. X: I draw sabers and charge the position from which we were fired on.

Director: (*To Lieut. D*) You are charged by about seven mounted Reds proceeding along the road from Taylor.

Lieut. D: I open rapid fire on them when they are opposite Dolman.

Director: I consider the fire sufficient to check the charge. There would be difficulty in pushing the charge home in any case on account of the ravine

northeast of Burns, which is crossed only by a wagon bridge. The Reds fall back in disorder behind the Taylor ridge.* Mr. D will retire.

Lieut. X: I assemble all of my party as soon as I can and send a message to Captain R. I will then move west, by Moss, north and west to the two hills marked 900, and follow the railroad track southeast to the Atchison Pike. I keep three men on my left watching the Blue position. I will take the Atchison Pike to Government Hill and then turn south along the ridge.

Director: Write the report and bring it to me when you are next called in. Please ask Mr. D to return. (*Lieut. X goes out and Lieut. D comes in*). When the Reds were repulsed the three men detached by you at Frenchman rejoin you. They tell you that they have been watching two Red cavalrymen who were about 300 yards west of Taylor but have now disappeared in the direction of Taylor.

Lieut. D: I order them to go back to the ridge northwest of Burns and watch the Reds from there. I hold my ground and write a message.

Director: Bring the message to me the next time you are called in. At 2.55 P. M. you are informed that a party of mounted Reds is moving west near the Moss house.

Lieut. D: I mount my party and gallop forward to the Taylor ridge, sending three men in the direction of Moss to keep in touch with them.

Director: At 3 P.M. you are on the Taylor ridge and have information that there are about eight Reds near the A. T. & S. F. R. R., west of you—moving southward.

*It will be noticed that the director does not assess losses—though they are no doubt severe. Losses are not always assessed when the exercise can be carried on without doing so. If the director thought the losses sufficiently heavy in this case to warrant it, he might inform Lieut. X that the subsequent forward movement was impracticable.

Lieut. D: I send another man to join the three already detached and carry them an order to follow the Reds and watch them. I go to Kickapoo at a trot by the Taylor S. H.—A. Daniels road, with three men.

Director: When you reach the cross roads here (17) you come upon two dismounted Reds, both slightly wounded, making their way toward Kickapoo.

Lieut. D: I capture them and question them.

Director: They will tell you nothing.

Lieut. D: I examine their insignia.

Director: They both belong to Troop D, 1st Red Cavalry. You have passed some dead horses near Taylor and seen the same letter and number on their equipments. What disposition do you make of your prisoners?

Lieut. D: It seems that they are able to walk and if I do not guard them they will give information of my movements. I disarm these men, put them in the Taylor school house, leave one of my men to guard them and go on to Kickapoo. I intend to come back to this school house when I complete my reconnaissance, get these men and take them back with me. I instruct my men that in case we become scattered we will assemble at this school house.

Director: You still have two men with you. In what order do you march?

Lieut. D: I go ahead, one man follows me at 50 yards, and the other is 50 yards further back.

Director: You may retire but please ask Captain R and Mr. X to come in. (To Lieut. X) Have you finished the message you were to write? (Lieut. X hands the message to the director, who reads it and hands it to Capt. R and then makes some measurements and computations. Lieut. X retires.) Captain

R, this message is brought to you by a mounted man of Lieut. X's patrol at 3 p.m.

Capt. R: I make no change in my dispositions.

Director: At 3:15 p.m. it is reported to you that two Blue cavalrymen have crossed Plum Creek and are moving north on the A. Daniels—Schweizer road.

Capt. R: I will go up on Hill 929 and watch them with my field glass.

Director: You see one here (placing a blue pin about 100 yards south of 23) another here, and still another here. They are moving at a walk, you see no one following them, and they do not appear to have seen your outpost.

Capt. R: I caution my men not to show themselves and not to fire.

Director: Please call Mr. D. (To Lieut. D) You reach the point shown by the blue pin here at 3:20 p.m. without seeing anything more of the enemy. What route do you take now?

Lieut. D: I will leave the road at the cross roads (23) and go up on the hill there (929). I ought to get a good view from that hill.

Director: You ride into a concealed party of Reds on Hill 929 and are captured.

Lieut. D: I fire my pistol as soon as I see them. Do not my men escape?

Capt. R: As soon as the leading Blue trooper sees us I open fire on the others.

Director: I rule that the trooper at the rear of the patrol escapes. Mr. D, you can now direct the movements of this man.

Lieut. D: What has he seen?

Director: He has made out a Red infantry picket of about 20 men, on Hill 929, and another of about the same size near the L. A. Aaron house, here.

Lieut. D: He goes back to the Taylor school house as fast as he can.

Director: That will do. You may both retire.

The director now studies the movements of the patrols of Lieutenants Y and C. Although Lieut. C announced an intention to move at a trot, the director believes that he would not trot continuously from South West Hill to Atchison Cross, and estimates that some minutes would be lost in giving instructions to the detached patrol and in gaining the ridge between the target butts and Wagner Point.

Lieut. Y will probably walk up the steep slope south of Plum Creek and down the slope near J. E. Daniels. In studying the question as to when these patrols would see each other, if at all, he takes into consideration the haze in the atmosphere, Lieut. C's precaution to avoid exposure, that Lieut. C does not stop to use his glasses, and the hedge and other obstacles along the south side of the Millwood road.

Director: (*to Lieut. C,*) As you approach Hancock Hill the men in front of you signal "enemy in sight" and one of them comes back at a gallop and informs you that he has just seen two Red cavalrymen on the Millwood Road,—that they were going east at a trot and disappeared in the wood here (east of Kern). They did not appear to have seen your men.

Lieut. C: I halt and post my men so as to watch Sheridan's Drive in both directions and the Millwood Road. I then write a message to Capt. B.

Director: What is the substance of the message?

Lieut. C: That two Red cavalrymen have been seen near Kern. I will then move cautiously along the edge of the wood to the Millwood Road. I halt there and wait for the patrol which I sent to Fort Leavenworth.

Director: How long will you wait?

Lieut. C: Not more than fifteen minutes. If the patrol does not come up before that, I will then go on to Taylor S. H. and from there north to Kickapoo.

Director: You may retire. Please ask Mr. Y to come in. (*To Lieut. Y.*) On approaching the Prison Cemetery at 2:37——

Lieut. Y: It was my intention to send three men east to the Missouri Pacific railroad to follow the railroad south and join me at the crossing of Shady Creek. I intend to detach them immediately on entering the wood east of Kern.

Director: You gave me your intentions as far as Fort Leavenworth and said nothing about this patrol. I make it a rule not to go backward even if it causes some dissatisfaction for I have neither the time nor the inclination to make computation of time and space twice.

Lieut. Y: I must send this patrol because my road goes diagonally through the wood and I can see but little until I reach Shady Creek. The patrol is to push directly across the wood and watch the open ground to the east. It was my intention from the first to do this.

Director: Very well, I will credit you with having sent the patrol.* At 2.38 P.M. you are approaching the Prison Cemetery and have reached the point where I place this block when you hear firing in front of you and the two men in your front come back at a gallop. The fire continues. Your men have seen nothing.

Lieut. Y: I order them to go back and find out something. That is what they were put there for.

Director: One of the men has been hit and the other's horse goes lame. Your party is under fire.

Lieut Y: I will change the sound man to the sound horse, and send him and two other men to the front to reconnoiter.

*This concession of the director is more apparent than real

Director: While you are giving the orders for this another man and two more horses are disabled.*

Lieut. Y: I countermand the orders, take cover at the side of the road, and dismount to fight on foot.

Director: The fire ceases.

Lieut. Y: I form skirmish line dismounted and advance at a double time.

Director: You see through the wood a Blue trooper retiring southeast at a gallop. When seen he was where I place this pin, but he disappears immediately.

Lieut. Y: I mount and move forward at a trot, sending three men forward at a gollop.

Director: As you approach Shady Creek (here) you hear firing and the three men sent forward come back at a gallop. They have seen two dismouted Blues here (in the ravine west of Blunt Hill) and believe that there are seven or eight Blues there.

Lieut. Y: I dismount in the Shady Creek ravine and send my horses to cover about one hundred yards to the west. I will open fire on the Blues if they show themselves. I wait here for my detached patrol.

Director: How long will you wait?

Lieut. Y: As it has not joined me already I suppose it has met opposition. Nevertheless, I will wait ten minutes. I will then charge the enemy dismounted.

Director: Your patrol does not arrive. When you advance you find no one in the ravine, but three Blue troopers are seen here, galloping south. They turn west (here) and disappear in the vicinity of the cavalry stables.

Lieut. Y: I mount and pursue them†

Director: It will now be necessary to close the

*The director assesses losses to convince Lieut. Y that he is really under fire, of which fact he seems oblivious.

†This exercise might profitably have been carried further.

exercise, for we have only enough time left for the discussion. Please call both parties to the map.

The director states the strength of both outposts and explains their dispositions, states the strength and missions of the four officer's patrols and describes briefly their movements. He then comments on the exercise as follows:

The cavalry of the Red outpost (with the exception of the patrols) was held in the reserve. If this cavalry had been pushed to the front to hold the main roads, say at the bridges over Plum Creek, it might have held hostile patrols at a distance. One of the Blue patrols came in contact with the Red infantry outpost and developed its position; the other would probably have done so if the exercise had been carried further.

The formations taken by the four officer's patrols were different and the exercise illustrates some of the advantages and disadvantages of the methods used. Mr. D, being at the head of his patrol, gained an early view of his antagonist, and placed his patrol in concealment more quickly than he otherwise could have done, but the post selected is dangerous as shown by Mr. D's experience on Hill 929. By placing himself at the head of his men an officer can control them by means of signals—quickly and silently. Mr. X, in selecting what he calls a "normal" formation, found that his flankers could not make rapid progress over difficult streams, fences, plowed ground, etc., and was considerably delayed by them. The flankers did not see much that could not be seen from the road and this work was very exhausting for their horses. He also found, when he desired to use the effective strength of the party in combat, that it was too much dispersed.

Mr. C did not appear to take into consideration the advisability of reconnaissance on his flanks, and

seemed more desirous of avoiding observation than of gaining information. His route—along Sheridan's Drive—gave an excellent view of the country to the north and west, of which he did not fully avail himself.

Mr. Y adopted an ironclad rule of sending patrols on every lateral road. This is not necessary in every case. In this case, the Millwood road and the Taylor S. H.—Frenchman road were covered by Lieut. X's patrol and the Sharp—Klasinski trail could be overlooked from the road.

The patrolling of lateral roads is exhausting work and should be done sparingly. In addition to the reconnaissance of lateral roads, it is often advisable to send patrols to good posts of observation near the road taken by the main party. Mr. D's sending two men to the top of Sentinel hill is approved.

Cavalry patrols, as a rule, move rapidly over ground from which a good view cannot be obtained, and pause at good posts for observation. Mr. Y might have stopped for a minute on the ridge west of J. E. Daniels to sweep Salt Creek valley and the heights to the east with his glasses.

The non-arrival of Mr. Y's detached patrol at the crossing of Shady Creek was due to the fact that this patrol, not being familiar with the country, lost the trail in the wood and wandered about for some time without being able to find the way out. Mr. C was similarly disappointed in the non-arrival of the patrol which he sent to Fort Leavenworth. This patrol was commanded by a young corporal possessed of more zeal and military ardor than discretion. He discovered Mr. Y's patrol near the Prison Cemetery, and immediately instituted an independent campaign on his own initiative. He succeeded in delaying Mr. Y's patrol and inflicting some losses on it, but he would have shown better judgment if he had evaded it and

rejoined his own party as he was ordered. These incidents illustrate the mishaps which occur not infrequently in cases of patrols commanded by inexperienced leaders and show that the performances of detachments sent beyond our own observation do not always come up to our expectations.

The message sent by Mr. C from Hancock Hill did not contain information possessing any special significance. It was known that a detachment of the enemy was near Kickapoo and it was to be expected that small parties of cavalry would be seen in the vicinity. The information was not of sufficient importance, in this case, to warrant sending a message; but it would have been otherwise if no enemy had been known to be about.

Mr. C's decision not to pursue the Reds seen, but to continue his reconnaissance, is approved. We might, of course, speculate on the probable consequences of an onslaught by Mr. C on the rear of Mr. Y's patrol while it was engaged in front; but, as a rule, the pursuit of hostile patrols is more likely to result in broken down horses and wasted time than in the accomplishment of anything advantageous.

I cannot approve of Mr. X's mounted charge under the circumstances. He, of course, did not wish, to be delayed, and he perhaps believed the Blue force to be insignificant; but the facts that his movements were confined to a narrow road and that there was a ravine in front of the enemy should have been given more weight in making his decision. His perseverance in continuing his reconnaissance and not allowing himself to be drawn into a dismounted combat with his antagonist is commended.

I cannot see any sufficient reason for Mr. D's detaching half of his patrol to follow Mr. X. His mission was to learn what he could of the main hostile force, and these four men might have been very use-

ful to him later. This patrol started out with an officer and eight men and was in a short time reduced to a single trooper. This man gained important information but there is a probability that he would not have succeeded in carrying it through to his own outpost. A patrol commander should avoid depleting his patrol except for good cause.

Mr. D would also, in my opinion, have shown better judgment by leaving the main road after passing Frenchman, selecting a route further west from which he could keep the road under observation, and seeking high ground at the enemy's flank or rear from which his position could have been overlooked. Crook Point would probably have served this purpose and could have been reached without opposition, though its importance would have warranted the Red outpost in placing a detached post there.

The roads in front of an army are usually held by its cavalry. Cavalry patrols are most likely to secure information when directed toward the flank or rear of an enemy. When a patrol is to traverse long distances, it must use roads in order to cover them in good time. But in this case the distances were not great enough to make it important to remain on the roads.

Our exercise today illustrates some of the difficulties and dangers of cavalry patrolling and shows that skill, judgment, boldness, and willingness to sustain losses are essential requisites in a leader of a cavalry patrol.

No. 2

Detail: Director, Capt. A
Commander, Blue, Capt. B
Assistants, " Capt. C and Lieuts. D, E and F
Commander, Red, Capt. R
Assistants, " Lieuts. X and Y

As the exercise is a simple one, no assistant for the director is detailed.

All of the participants were notified at the last meeting that the next exercise would be in the duties of advance and rear guards.

At the hour set for the exercise the director calls the Red party to the map and hands to the commander the following general and special situations, which the commander reads aloud to his assistants.

GENERAL SITUATION

On November 2, a body of Red infantry is retreating south through Fort Leavenworth, Kansas, pursued by a larger force of Blues. The weather is clear and the roads are dry. Corral Creek is unfordable.

SPECIAL SITUATION,—RED

The rear guard of the Red infantry consists of one company, under your command. At 10 A. M. you are with the rear party (1 section) which has reached One Mile Creek on Grant Avenue, and have received a message from your commanding officer, directing you to hold the enemy in the vicinity of One Mile Creek for an hour in order that the bridges over Corral Creek may be prepared for demolition. Your support (3 sections) is on Grant Avenue opposite Devin Ridge. A small party of Blue cavalry has been following you closely and is now near the corner of Grant and Pope avenues. Dust can be seen rising in the north end of Fort Leavenworth.

After finding on the map the various localities mentioned in the problem, the Red party withdraws and the Blue party enters. The Blue commander is handed the following problem, which he reads aloud.

GENERAL SITUATION

On November 2, a body of Red infantry is retreating south through Fort Leavenworth, Kansas, pursued by a larger force of

Blues. The weather is clear and the roads are dry. Corral Creek is unfordable.

SPECIAL SITUATION,—BLUE

You are in command of the advance guard which consists of two companies of infantry and a squad (12) of cavalry. Your orders are to push the enemy vigorously. At 10 A.M. your cavalry is at the corner of Pope and Grant Avenues in touch with the enemy; your support (one platoon) is at the corner of Grant and Kearney Avenues, and the reserve (1½ cos.) is west of the U. S. Military Prison. The main body of the Blue force is approaching Shady Creek, where it is to halt ten minutes. You are mounted and with the support.

The Blue party examines the map long enough to find the places named and then withdraws. The Red party is called to the map and Capt. R announces that he will send the 4th section (now the rear party) under the command of Lieutenant Y to the ice house south of Merritt Lake—to hold Merritt Hill from Grant Avenue, exclusive, to Prison Lane, inclusive, and patrol to Engineer Hill; and send the 3d section under command of Lieut. X to knoll 850 at the east end of Devin Ridge—to hold Devin Ridge from Grant Avenue, inclusive, to the Missouri River, and patrol toward the bridge over the Missouri River. The 1st and 2d sections are to halt at the east side of Grant Avenue opposite its junction with the Cavalry Drill Ground road. Capt. R. is with them* Capt. R says that this order is communicated to Lieut. Y verbally immediately on receipt of the message from the commanding officer; that immediately afterwards he goes to Devin Ridge and gives the order to Lieut. X

*As an exercise Capt. R. might be required to write this order, or he might be required to make a sketch or tracing showing his dispositions.

who would naturally halt on seeing the movement of the rear party.*

Lieut. Y says that he will order selected sharpshooters to fire on any Blue cavalry seen watching his movements, move his section by the trail south of Merritt Lake to the ice house, deploy two squads about 100 yards south of the ice house, place one squad in the depression about 50 yards further south, and send one squad to Engineer Hill.

Lieut. X says that he will deploy the whole of the 3d section on knoll 850, with the exception of one squad which is ordered to go to the old railroad bed and follow it as far as the buildings, which can be seen on the hill to the northeast of Devin Ridge at a distance of about 700 yards and watch the roads in that vicinity.

Capt. R says further that the 1st and 2d sections are placed in concealment and the men lie down; he wishes to know how many mounted orderlies are with him and the director replies that there are none.

The director places blocks, to represent the dispositions described, shows them to the Red officers, makes pencil notes of their positions (which he also impresses on his memory) and then removes the blocks from the map. The Red party retires.

The Blue party enters, and Capt. B says that he will continue to advance on Grant Avenue. He assigns Capt. C and Lieut. F to the reserve, Lieut. E to the support, and Lieut. D to the cavalry. The director requests all of the Blue party except Lieut. D to withdraw.

Director: At about 10 a.m. two or three of your advance troopers are fired on from the east end of Merritt Lake. You move forward to a good post of

*According to the data it appears that the message was received before 10 A.M. The director considers that Capt. R's order to Lieut. Y was given at 10 A.M.

observation about 300 yards southwest of the car station and see about twenty or thirty Red infantrymen moving west along the south side of Merritt Lake. You also see indistinctly through the trees a formed body of Red infantry moving east from Grant Avenue on Devin Ridge. You have been following a company of Red infantry, but now all Red troops have disappeared from Grant Avenue. What is your estimate of the situation?

Lieut. D: It appears that the Reds are deploying and probably intend to check us on One Mile Creek. I will watch them, send a patrol to each of their flanks, and send a written message to the advance guard commander.

Director: What orders do you give the patrols?

Lieut. D: Four men are sent by Pope Avenue to Engineer Hill. Four are sent east to take the road which joins Farragut Avenue just north of One Mile Creek. They are to find the enemy's flanks, remain in observation, and send messages here.

Director: Write the message you send to Capt. B.

While Lieutenant D is writing the message, the director studies the map and decides upon the time required for the movements ordered. He then calls Capt. B, hands him Lieut. D's message, and informs him that this message is handed to him by a trooper at the corner of Pope and Grant avenues at 10.06 A. M. The message is as follows:

From Advance Cavalry At 300 yds. S.W. of Car Stat'n. Communicated by Mtd. Messenger.
Date 2 Nov. Hour 10.05 A. M. No. 13
To Capt. B,
Fired on near MERRITT Lake. Red infantry is deploying on south side of One Mile creek. Have sent patrols to reconnoiter their flanks. Remain in observation.
Received at 10.06 A. M. D, Lieut.

Capt. B decides to halt the advance guard, reconnoiter the ground in his front, and wait for reports from the patrols.

Director: At the best near-by post of observation you find Mr. D. With the aid of your glasses you make out three or four Reds at a locality pointed out by Mr. D—(here), south of the ice house. At 10.08 A. M. you observe a Red infantry patrol ascending the southeast slope of Engineer Hill—a minute or two later observe a struggle between this patrol and four mounted Blues—the Reds are victorious and the Blues retire westward. At 10.11 A. M. you hear firing to the southeast—at 10.13 two mounted messengers approach—the first is from the patrol which you have seen driven from Engineer Hill and he informs you that his patrol retired to the U.S. National Cemetery—the other tells you that his patrol was fired on from an embankment of an abandoned railroad on the north bank of One Mile creek and near Farragut Ave. (between X and 6) and that his patrol retired northward to a cut of the abandoned railroad (300 yards north of 6).

Capt. B: I wish to question the last messenger.

Director: Proceed.

Capt. B: Is the road from here to the cut you speak of sheltered from view from Devin Ridge?

Director: The farther half of this road is exposed—the messenger drew fire from the east end of Devin Ridge when he returned but he could see a road nearer to the river (Farragut Avenue) which was sheltered from Devin Ridge.

Capt. B: What is the nature of One Mile creek?

Director: He did not reach it. He noticed that the woods were thick east of the railroad bridge, but he could not see the creek. None of your troops have reconnoitered it, but from where you stand you can see that west of the railroad bridge the south bank is steep and three or four feet high. What is your estimate of the situation?

Capt. B: The enemy occupies a very long line, half a mile or more; his patrolling north of One Mile Creek looks aggressive. He has probably been reinforced. Nevertheless my orders require me to maintain a vigorous offensive and I will attack at once. If I encounter superior numbers I will soon be supported by our main body. Where is the infantry of the advance guard at present?

Director: It halted at 10.07 A.M., in compliance with orders from you. The support is at the car station—the men under cover west of Grant avenue. The reserve is at the corner of Grant and Kearney avenues.

Capt. B: I will assemble the officers at the car station and issue an order for the attack. My order is as follows:

"The enemy is in position on that ridge (Devin) and south of that lake (Merritt). His strength is not known.

"We will attack, enveloping his right flank.

"The support (1st Plat. Co. A), commanded by Lieut. E, will advance at once east of Grant avenue to the ridge between here and One Mile creek and support the main attack, which—consisting of Company B under command of Captain C—will move by Farragut avenue against the east end of Devin Ridge.

"The 2d Plat. Co. A, under command of Lieut. F, will form the reserve and move under cover to the railroad siding.

"The cavalry will observe the enemy west of Grant avenue.

"Send messages to the reserve."

I will also send a message to the commanding officer, informing him that the Reds are in position on Devin Ridge and appear to have received reinforcements. The director notes the substance of the

order, estimates that it was issued at 10:25 A.M., and inquires of the subordinate commanders their intentions.

Capt. C says that he will march east on Kearney Avenue to Farragut and then march south on Farragut Avenue to One Mile Creek, and that he will order the men to march on the sides of the road to avoid raising dust.

Director: When you reach this point (east of old R. R. cut, 500 yards south of the bridge over the Missouri river) the head of your column is fired on from this point (old R. R. embankment between X and 6).

Capt. C: I deploy my leading platoon and advance it at double time—march direction, knoll 850 at the east end of Devin Ridge. The other platoon follows in column of squads at 100 yards.

Director: You are impeded by thick underbrush, One Mile Creek, which here has almost vertical banks about six feet high, and a railroad cut.

Capt. C: I urge my men forward as rapidly as possible.

Lieut. E indicates his route, shows the position he will take, and says that he will open fire on any Reds seen, but will fire slowly until Co. B assaults and then order fire at will on Devin Ridge.

Lieut. F indicates the route he will take.

Lieut. D says that he will order his eastern patrol to rejoin him as soon as Co. B is seen coming up and that he will open fire on the Red patrol on Engineer Hill from his present position and order his patrol at the Cemetery to do likewise.

The Blue party withdraws, and the director computes the time necessary for the movements ordered, makes notes, and recalls the Red party.

Director: Your company is in the position ordered at 10:06 A.M.—the dust which was seen in the north-

ern part of Fort Leavenworth becomes denser for a time but disappears at about 10:08—at 10:06 you see Blue infantry near the car station, but it disappears in a minute or two apparently toward the west—at 10:10 you hear firing both at Engineer Hill and near Farragut avenue, and shortly afterwards receive messages informing you that your patrols have repulsed small parties of Blue cavalry—at 10:27 you hear light firing in the direction of the infantry barracks and shortly afterward from the National Cemetery—at the same time you see about 50 Blue infantrymen cross to the east side of Grant avenue near the car station—at 10:31 a desultory fire is opened on Devin Ridge from the ridge about 170 yards northeast of Merritt Lake—at 10:35 you see a cloud of dust, considerably larger than the former one, in the north end of Fort Leavenworth—at 10:42 you——.*

Capt. R: At 10:40 I send an order to Lieut. Y directing him to withdraw his section to the post of the reserve.

Lieut. Y: On receiving the order I will signal the patrol on Engineer Hill and will withdraw without showing myself, moving at first south and then east.

Director: At 10:42 you see three or four Blue infantrymen near the railroad siding—the dust in Fort Leavenworth has disappeared—at 10:47 you hear rapid firing near Farragut avenue which increases in volume, together with loud shouting and the sound of whistles—at the same time a sheet of fire breaks out from the ridge in front of you—you see Lieut. Y with his section here (where I place this block) approaching from the west.

*The director unfolds the situation slowly and impressively, making occasional pauses. Commanders give orders on their own initiative whenever the situation appears to them to demand action on their part. The director sometimes asks a commander for his estimate of the situation in order to be sure that the information given is understood. It is not to be expected, however, that the commander's estimate of the situation will be identical with that of the director.

Capt. R: I retire to Pope Hill with the reserve, keeping under cover of the trees east of the road—I send an order to Lieut. X directing him to fall back to Rabbit Point and informing him that I will support him with fire from Pope Hill—I order Lieut. Y to retire slowly along the street car track leaving a patrol on the ridge temporarily to observe the enemy—I send a message to my commanding officer informing him that I am attacked by superior numbers and am falling back to Pope Hill and requesting him to support my withdrawal from Pope Hill with fire from the south bank of Corral Creek.

The director now calls the Blue party and takes up the discussion.* He states the special situation given each party, recapitulates rapidly the steps taken by each, shows with blocks the situation of both parties at 10:50 A.M., and comments as follows:

The line which the Red company undertook to defend was entirely too long. The assignment of a section of a defensive line to a fraction of a company is very unusual. A company should not be broken up in this way. The sections were so long that they could not be effectively defended by the troops assigned to them.

The men sent to the ice house were of very little use there. The Blues could not advance across Merritt Lake, and if they advanced west of it they would have been seen in time to allow the Red company to flank them from Merrit Hill or intercept them on Long Ridge. The long line occupied had the effect of deceiving the Blue commander, and, owing chiefly to the dilatory character of his movements, it was successfully held; but if he had attacked promptly between Grant Avenue and the railroad, the Reds would have needed all of their men there to check him. The withdrawal of the Reds from Devin Ridge

*The exercise might have been carried further.

to Pope Hill was timely and provision was made for mutual support.

Sending patrols so far to the front and flanks was not essential to carrying out the mission of the Red company. These patrols gave the Blue cavalry a great deal of annoyance and prevented it from pressing in on the flanks of the Red company. They also added to the mystification of the Blue commander. Their success in this case was due largely to their finding exceptionally good positions; one was protected on its right by the river and the other found on Engineer Hill an exceptionally good field of fire in all directions. But the detachment of small parties of infantry to such distances is hazardous.

Several minutes were consumed by Mr. D in writing a message which in this case might better have been sent verbally.

The decision of the Blue commander "to attack at once" is approved; but he was slow in arriving at this decision and did not carry it out promptly.

The situation of the Red rear guard with an unfordable stream at its back offered an opportunity to the pursuers to cut it off or inflict heavy losses on it; but such opportunities can be turned to account only by boldness and activity on the part of the pursuers.

A frontal attack over open ground is certainly a delicate affair against even an inferior enemy. But here the ground was not open. The bed of One Mile Creek especially favored a direct attack. The Blue advance guard might have advanced with little exposure to the ridge east of Grant Avenue and from there could have gained the bed of One Mile Creek at a run—advancing one platoon at a time, supported by the fire of the other three. Devin Ridge could have been carried with the bayonet before the Blue commander finished issuing his orders for the attack. Captain B's combined order for attack might have

been commended in a solution of a map problem; but the two side map maneuver shows us that we cannot always take the time necessary to wait for the results of reconnaissance, to assemble officers and issue combined orders.

Such wide turning movements as that ordered are seldom employed by such small forces; and, in this case, the method of attack was inconsistent with the mission of the advance guard. The advance cavalry was in touch with the enemy and the infantry was close behind. The deployment of the Reds was observed. The sooner the attack was launched against them the less opportunity they would have to select a position and strengthen it. The Blue main body reached the corner of Grant and Kearney avenues at 10:35 a.m. and would have been ready to support the attack if needed.

As it happened, the Blue main body was compelled to wait a considerable period for the advance guard to act, and this delay is not likely to be acceptable to the commanding officer. When he finds that the carefully planned attack of the advance guard strikes nothing but an empty ridge his dissatisfaction will be increased. Captain B's experience should warn us against jumping at the conclusion that our enemy has been reinforced, and especially against reporting it as a fact, without definite information.

Captain B's selection of a point of attack was unfortunate; the difficulties encountered by the main attack in reaching Devin Ridge were unusual and hardly to be expected; but the possibility of meeting such obstacles should be kept in view in ordering an attack over ground which has not been reconnoitered.

The ground in front of the center of the enemy's position lay in plain sight and contained no serious obstacles. The enemy's left was covered by Merritt Lake. Captain B seems to have reasoned that since

the attack could not envelop the enemy's left it must inevitably be directed against his right.*

DIRECTOR'S NOTES

MAP MANEUVER NO. 2

BLUE		RED	
Cavalry patrol (4) Eng. hill	10.10	In position	10.06
Cav. patrol (4) old R.R.	.11	3d Sec. Lt. X, Devin R, 4th Sec. Lt. Y, sou. Ice House. 1st and 2d Secs. Capt. R, east of Grant.	
Support, Capt. B, corner Pope ave.	.06	Patrol 4th Sec. (8) Eng. hill	.10
Reserve, Capt. C and Lt. F, Kearney ave.	.06	Patrol 3d Sec. old R.R. embankment	.11
Cavalry patrols report	.13		
Offs. assemble car station	.20		
Order attack	.25		
Message to C.O. (enemy position reinforcement)	.27		
Cav. fires on Eng. hill	.27		
1st Plat. Co. A, ridge	.30		
2d Plat. Co. A, R.R. siding	.42	Message Capt. R to Lt. Y, (sent)	.40
Co. B starts Pope and Kearney ave.	.30	Message Capt. R, recd.	.44
Co. B arr. old R.R. cut	.47	Lt. Y, car track	.50
Main body cor. Kearney ave.	.35	Capt. R rets. to Pope hill	.48
		Capt. R mess. to Lt. X	.48

NOTE.—There can be no invariable form of keeping notes. They vary with the exercise and the needs of the director. They do not contain a complete record of the exercise, but only such data as the director may need to assist his memory. If the director has an officer to assist him, the notes will be kept by the assistant. Written orders, messages and memoranda written by commanders and sketches or tracings made by them showing dispositions, orders of march, etc., are attached to the notes and lighten the work of the director.

NO. 3

General Situation:

On Sept. 15, a Blue corps whose base is Kansas City is near Atchison, pursuing northward a beaten Red corps. The Blues have an entrenched camp at Kickapoo. The Missouri Pacific R. R. is the line of communications of the Blue corps. The country is friendly to the Reds. The weather is clear

* The decisions, orders, etc., in this and the preceding exercise are not intended to be taken as models of correctness. It will be noticed that the director states his opinions in a fearless and positive manner. This is thought desirable; although, of course, his opinions are not authoritative.

and cool and the ground is dry. Salt Creek and Plum Creek are serious obstacles.

Special Situation—**Red:**

A regiment of Red cavalry is approaching Leavenworth from the southwest with the object of destroying the Missouri Pacific R. R. and capturing a small Blue detachment reported to be there. Two troops have been detached to proceed by the Atchison Pike to cut off any Blue troops found retreating northward to Kickapoo, which is reported to be strongly held by the Blues. You are in command of these two troops and at 8 A.M. are at the head of the main body of your detachment on the Atchison Pike 500 yards west of Mottin. Your advance party, 12 men, is opposite Mottin and has just reported seeing a thick cloud of dust in the direction of Sentinel Hill.

Special Situation—**Blue:**

A battalion of Blue infantry, without horses or machine guns, under your command, has been sent from Kickapoo to Leavenworth to patrol the railroad. You have received reliable information that a large force of Red cavalry with artillery has been seen about ten miles southwest of Leavenworth at 6 A.M., apparently marching on that place; you decide to retire to Kickapoo which is well garrisoned and protected by field works. At 8 A. M. your leading element has reached Frenchman, the main body (3½ companies) has reached the fork of the road leading to Gauss, and you have just received information from a flanking patrol that a small party of horsemen was moving east on the Atchison Pike near Mottin.

The opposing forces are here placed in contact at the outset and an important decision is required of each commander. The Red commander reasons that the dust seen may be caused by Blue troops retreat-

ing from Leavenworth to Kickapoo on the Kasten-Frenchman road, and that it is his duty to capture them if he can. If they are too strong to be captured by his detachment, he must inflict losses on them and check or delay them until reinforcements can be obtained. Since Salt Creek is a serious obstacle, his best opportunity for checking the Blues is at the bridge near Frenchman. The possession of this bridge is important, but if he cannot seize it, he can bring dismounted fire on it while the Blues are crossing or attempting to debouch from it. His *decision* is to move forward rapidly on the Atchison Pike, take such action as circumstances require as the situation develops, sending a message to the regimental commander as soon as it is definitely known that Blue troops are in his front. His *orders* are "Gallop, March".

The Blue commander does not believe that the main body of the Red force, from which he is retreating, is on the Atchison Pike, because it was reported to be southwest of Leavenworth, while the Atchison Pike runs northwest. The horsemen seen are thought to be Red scouts reconnoitering at a distance from their main column, However, they may be the leading element of a strong patrol or of a detachment large enough to be able to cause considerable annoyance. As it is now 8 A. M. and the Red force was reported to be composed of mounted troops and to be only ten miles distant two hours before, they may now be entering Leavenworth; he has, consequently, no time to lose and must not allow himself to be checked or delayed. If the information on which he is retreating is correct, the Red force is probably an independent brigade of cavalry. He will be safe when he crosses Plum Creek. His best road is the direct Frenchman—Kickapoo road, but he has a defile directly in front of him (the bridge over Salt Creek).

Here a comparatively small force of the enemy might delay him by compelling him to force a crossing under fire, and inflict losses on him while crossing and attempting to debouch on the other side. He *decides* to expedite the march of the battalion until it is across Salt Creek to a rate of march approximating the "cavalry walk" (110 yards per minute); his *order* is "Step out" (delivered verbally to the battalion). In case fire is opened on the column, the advance guard will without orders at once attack the enemy: it will be reinforced if necessary: a new advance guard will be pushed forward: and the former advance guard, depending on the position and conduct of the enemy, may become successively a flank guard and a rear guard. After Salt Creek is crossed the high ground west of the Frenchman—Kickapoo road is the natural feature of the highest importance; from it the fire of an aggressive enemy, even if inferior in strength, could prevent the battalion from advancing in column on the road; it will, consequently, be necessary to cover this ridge with a flank guard, which will march northward along the ridge if practicable; if it is engaged so closely that it cannot gain ground to the north, fresh detachments must be thrown out, while those first sent fall back to the road and form a rear guard.

This maneuver illustrates the passage of a defile, debouching from a defile, a flank march and the delaying and harassing action of cavalry. The question as to whether cavalry can delay an infantry colums more effectively by operating against its head or its flank will, no doubt, receive attention in the discussion.

NO. 4

General Situation:

On June 20, a Blue army, whose base is Kansas City, Missouri, is operating in hos-

tile territory in the vicinity of St Joseph, Missouri, against a Red army whose base is Omaha, Nebraska. The weather is warm and clear. Salt Creek and Plum Creek are insignificant as obstacles.

Special Situation—**Blue**:

The 1st Infantry is at Beverly (three miles east of Fort Leavenworth) guarding the communications of the Blue army and has detached the 1st Battalion, with a machine gun platoon and four mounted orderlies, to go to Kickapoo and seize a quantity of supplies reported to have been collected there for the Reds. The battalion leaves one platoon at the Fort Leavenworth bridge over the Missouri River and at 8 A. M. is marching on the Millwood Road and its leading element has reached the Kickapoo—Frenchman road, when its commander, who is with the advance guard, is informed by a trusted spy that about 1000 cavalry camped at Lowemont the preceding night. At the same time mounted men are seen in the vicinity of Breidenbauch and a cloud of dust is seen further west.

Special Situation—**Red**:

The 1st Cavalry has been sent south to reconnoiter the west bank of the Missouri River and cover the removal of supplies which have been collected at Kickapoo. The regiment camps at Lowemont on the night of June 19-20, and at 8 A. M. is on the Millwood Road; its leading element, which is opposite Breidenbauch, reports seeing a column of Blue infantry east of the Taylor School House.

The commanders may be directed to submit sketches showing in detail the arrangement of their columns at 8 A.M. Although it is stated in the problem that Salt Creek and Plum Creek are insignificant as obstacles, the season of the year (June 20) should be taken into consideration in regard to movements

of troops off the roads. Cultivated ground would be soft and heavy and growing crops would impede progress but would afford cover for dismounted men. The Blue battalion commander finds himself confronted with conditions which were not contemplated by the regimental commander in sending the battalion to Kickapoo. The mission of the Blue 1st Infantry is to guard the communications of the Blue army (apparently the Burlington R.R.); the sending of the battalion to Kickopoo appears to be in pursuit of an object of secondary importance, and it seems that no considerable resistance was expected or a stronger force would have been sent. The Red force reported appears to be a regiment of cavalry but its mission is not known; it is probable that it will attempt to cross the Missouri River and destroy or interrupt the Burlington railroad; the Blue battalion has left one platoon at the Fort Leavenworth bridge, but this is probably insufficient in view of the changed conditions. The battalion could probably reach Kickapoo and seize or destroy the supplies there; but the importance of this task does not justify exposing the battalion to destruction or capture.

The battalion commander *decides*: to send the adjutant with two mounted orderlies to the vicinity of Sprong to reconnoiter the enemy; to retire to the edge of the wood east of Kern immediately, the advance guard becoming a rear guard; to send a message to the regimental commander, informing him of the changed conditions. If mounted Red troops appear in superior numbers and especially if they move toward Frenchman, the retreat will be continued to the bridge over the Missouri river.

The Red commander is ignorant of the strength of the Blue column (which may be the advance guard of a larger force) and his first concern is to cover the supplies in Kickapoo while reconnoitering the enemy

and endeavoring to ascertain his strength and intentions. His role, at the outset, is a defensive one, and his first move will be in the direction of Plum Creek with a view to interposing between the Blues and Kickapoo. He *decides*: To send the leading squadron forward rapidly to attack the Blues; to move the other two squadrons forward rapidly (on the Millwood—A. Daniels—Kickapoo road) to Plum Creek; and to send an officer's patrol around the enemy's left flank to ascertain the strength of the column and whether or not it is followed by supporting troops. If he discovers the Blue force to be considerably smaller than his own, he will attack with his whole force, preferably the Blues' left flank, and endeavor to cut them off from the Fort Leavenworth bridge.

NO. 5

Situation—**Blue:**

On October 20, a Blue detachment of all arms, in hostile territory, is moving via Leavenworth on Kickapoo, where it is to bivouac.

Its independent cavalry (one squadron with a machine gun platoon) has been directed to trot ahead and hold Kickapoo until the arrival of the detachment, reconnoitering the roads to the north and west. At 11 a.m. the main body of the cavalry (3½ troops) has reached Frenchman when its commander, who is at the head of the column, is informed that two small patrols of Red cavalry had been seen on the high ground about a mile to the northwest and that a cloud of dust was seen still further north which appeared to be moving eastward.

Situation—**Red:**

On October 20, a Red detachment in friendly territory is approaching Leavenworth via Lowemont and the Millwood Road. Its independent cavalry (one squadron) has

been sent ahead to secure the Terminal Bridge at Leavenworth. At 11 a.m., the cavalry commander, who is at the head of the main body (three troops) is opposite Sprong on the Millwood Road when he receives information that a body of Blue cavalry, estimated at three troops, was approaching Frenchman from the south.

Both commanders are given the information that, owing to a stock law which had been passed in Kansas, making fences unnecessary, all fences had been removed except those on small enclosures near farm houses, also that all crops had been removed and that the ground was hard and dry.

NO. 6

Situation—**Red:**

On June 1st, a Red force, consisting of the 1st Infantry (less 3d Battalion) and Troops A and B, 1st Cavalry, is covering the removal of a quantity of supplies from a storehouse at Merritt lake to the R. R. station at Fort Leavenworth. At 8:30 a.m. it is in position, all troops being north of Corral creek, when information is received that Blue troops are approaching from the south and have reached Metropolitan avenue. The removal of the supplies will be completed by 11 a.m.; they are to be sent to Atchison.

Situation—**Blue:**

On June 1st, a Blue force from Kansas City, consisting of the 3d Infantry and 3d Squadron, 3d Cavalry, with orders to capture or prevent removal of supplies from a storehouse at Merritt Lake, is approaching Fort Leavenworth from the south. At 8:30 a.m. its leading element has reached Metropolitan avenue on Broadway and information has been received that Red troops are holding the crossings of Corral creek.

Both commanders are informed that Corral creek can be crossed only at bridges and fords on Grant avenue, Farragut avenue and the Target Range road, and that the country west of the Leavenworth sheet of the maneuver map (600 yards west of the target range) is impassable.

NO. 7

General Situation:

On October 3, a Blue division is advancing via Platte City, Mo., on Fort Leavenworth. A Red division is concentrating at Atchison, Kansas. The Missouri River forms part of the boundary between the territories of the Reds and Blues. The Terminal Bridge at Leavenworth has been destroyed. Plum Creek and Salt Creek are serious obstacles. The atmosphere is foggy.

Special Situation—**Blue:**

The advance guard of the Blue division has reached Platte City, Mo., and has detached the 1st Infantry, Troop A, 1st Cavalry, and Battery A, 1st Field Artillery, to occupy Fort Leavenworth and cover the crossing of the division. The leading element of the detachment has reached the west end of the bridge at 1 p.m. The remainder of the Blue advance guard is expected to begin crossing at 4 p.m.

Special Situation—**Red:**

The 3d Cavalry, with Battery F, 5th F. A. (horse), has been sent from Atchison to check or delay the crossing of Blue troops over the Missouri river at Fort Leavenworth. At 1 p.m. the leading element of the detachment is two miles northwest of Kickapoo. Two regiments of Red infantry are expected to reach Kickapoo at 5 p.m.

In order to cover the remainder of the advance guard while debouching from the bridge, and to gain

sufficient room for their deployment, the Blue detachment will probably seek to occupy and hold the Sheridan Drive ridge. Here it will be able to make use of its artillery, but the position will be found to be too long to be effectively defended by so small a force.

If the Reds make a simple frontal attack on the Sheridan Drive ridge and the Blues concentrate in front of them, the Reds will probably be defeated. But if the Reds make use of their superior mobility, or if the Blue detachment is too greatly dispersed, the Reds may gain possession of a part of the ridge and probably compel the Blues to retire to the vicinity of the bridge. If the Reds gain possession of the ridge they can bring an effective artillery fire on the bridge and check or delay the crossing of the supporting Blue troops till nightfall.

NO. 8

General Situation:

On November 20th a Blue division is retreating through Leavenworth and Kickapoo towards Atchison pursued by a Red division. Salt creek is a dry ravine. The ground west of the map between the Millwood Road and the Atchison Pike is impassable (a lake).

Special Situation—**Blue:**

The Blue rear guard, consisting of—
1st Infantry
Battery A, 1st Field Artillery
Troops A and B, 1st Cavalry
One platoon of a field signal company—

has halted for the night near Burns. It is now 6 a.m. Nov. 21, and the rear guard commander has just received orders to hold ground south of Plum Creek until noon to cover the removal of supplies from Kickapoo. Blue cavalry patrols have been in contact with

hostile cavalry on the Atchison Hill—Southwest Hill ridge during the night.

Required:

1. The disposition of the rear guard at 6 a.m.
2. The next order of the commander.

Special Situation—**Red:**

The advance guard of the Red division consists of—

3d Infantry
5th Infantry
1st Battalion, 7th Field Artillery
3d Squadron, 9th Cavalry
Company D, 1st Battalion, Engineers
One field company, Signal Corps
Ambulance Co., 3d Field Hospital.

The cavalry reached Avenue hill at dark and bivouacked there; its patrols have been in contact with hostile cavalry on the Atchison Hill—South West Hill ridge during the night. The remaining troops of the advance guard halted for the night two miles further south. It is 6 a.m., Nov. 21st, and the advance guard has just been set in motion.

Required:

1. The dispositions and orders of the cavalry commander.
2. The order of march of the remainder of the advance guard.

After the attack of the Red advance guard on the position selected by the Blue rear guard has fully developed, the Blue rear guard commander is handed a message from the commander of the Blue division stating that the removal of the supplies from Kickapoo has been completed and that the Blue division has nearly cleared Kickapoo. The rear guard is directed to withdraw to Kickapoo. The withdrawal to be supported by a battery on hill 929.

The problem illustrates the selection of a position, an attack and defense and the breaking off of an engagement.

Note—All of the foregoing maneuver problems may be varied by changing the strength and locationof the forces.

CHAPTER V.

TACTICAL RIDES

Tactical rides are analogous to tactical map maneuvers. They cover nearly the same field of instruction and the differences in the methods of conducting them are only such as result from the use of actual ground instead of the maneuver map.

The use of actual ground gives to tactical rides some important advantages over map maneuvers; for the study of ground is one of the most valuable elements of military training; and maps are, at best, but imperfect representations of ground. For this reason, tactical rides are classed as second only to field maneuvers as a means of instruction in tactics. Tactical rides even possess some advantages over field maneuvers, in that they permit a more detailed study of instructive situations. They are more perfectly under the control of the director, and he has more complete knowledge of the situation and can stop the operations at any desired point and discuss them while the events considered are fresh in the minds of all.

But the employment of real ground instead of the map introduces some difficulties into the work of conducting the exercises, and imposes some important limitations upon the character of the exercises which can be conducted in this way and, consequently, upon the scope of their utility.

Experience in conducting map maneuvers has shown that very large scale maps are inconvenient The scale twelve inches to one mile is probably the

largest that can be conveniently used and this is convenient only when small forces are considered, or troops operating in very restricted areas. An infantry division or a cavalry brigade cannot be conveniently handled on a map whose scale is greater than six inches to a mile, while on a Geological Survey Map we may start two cavalry divisions fifty miles apart and make all needful decisions in regard to their movements.

But as the scale of the map is increased the area covered by the operations under consideration must be diminished. And the ground is on a scale which is more than five thousand times larger than the largest scale maneuver maps. In a tactical ride, where the scale of the maneuver map (the ground) is one to one, a single director can not handle two opposing forces which are a mile apart except slowly and with difficulty.

However, almost any one side maneuver can be conducted in a tactical ride; and one side maneuvers give better opportunities for instruction, in some respects, than two side maneuvers. One side maneuvers afford excellent opportunities for instruction in troop leading and for making a detailed study of military operations. Outposts, positions in readiness, the selection of defensive positions and studies as to the best methods of strengthening them with defensive works and of occupying them, deployments, etc., are common topics for one side maneuvers and can be advantageously conducted on the ground as tactical rides. When it is desired to conduct a two side maneuver as a tactical ride, the opposing forces should not be large; should be started in contact with each other and given missions which will ensure their remaining in contact. The attack and defense of positions and retreat and pursuit are suitable exercises for two side maneuvers conducted by this method.

The use of maps should be reduced to a minimum and only such maps should be employed as are likely to be used in war. If the participants have detailed maps of large scale they are likely to solve their tasks by reference to the map only and lose the benefit of the study of the ground which is one of the important objects of these exercises. All of the participants may be provided with maps of the U. S. Geological Survey, if available; and it is desirable that all officers should acquire familiarity with these maps as they are the nearest approach that we have to a military map of our country.

The ground selected for tactical rides should in most cases possess a number of good points of observation and a number of features of tactical importance, small woods, hills, streams, etc. Ground dominated by a single feature is not favorable, and but little can be done in an open level country or a region covered entirely with woods.

Each participant in a tactical ride should be provided with a pad of message blanks, a lead pencil, a watch, compass and pair of field glasses.

In tactical rides written estimates of the situations should not be required and the drafting of written orders should be reduced to a minimum. Work of this kind is certainly desirable but it can be more appropriately done in the solution of map problems or in connection with map maneuvers.

Sketches are often indispensable; they compel attention to details which might otherwise be overlooked, prevent officers from forgetting portions of their forces, and compel definite decisions.

It is not necessary that all or any of the participants should be mounted on horses; automobiles, wagons and bicycles are often more convenient than horses. Sometimes all of the participants are on foot; the exercise is then called a "tactical walk."

ONE SIDE EXERCISES

In one side exercises the whole party is assigned to one side. After reaching the point at which the operations are to begin, the director explains the initial situation and assigns tasks to members of the party. All members of the party may be assigned the same task, or different tasks may be assigned to each. If all have the same task the discussion which follows will be more complete, while if each has a different one the exercise will progress more rapidly and may be made more interesting. Thus both methods have their advantages and both may be used in the course of the same day's work.

The tasks are given out at some point affording a good view of the ground on which the troops employed are supposed to be at the beginning of the exercise; and some other point favorable for observation, in the direction in which these troops are supposed to be moving, is pointed out as the place for assembling on the completion of the tasks assigned, and a definite hour for the assembly should also be announced.

The tasks assigned usually take some such form as the following: "Mr. X, you are in command of the advance guard, which consists of one battalion. You will be prepared to give me verbally the orders you would give on receipt of information that your point has been driven back and your support checked by fire from the crest of the hill you see yonder. Also make a sketch showing the manner in which the ad-advance guard will be employed. Report to me on top of that hill at ten o'clock." "Mr. Y, you are in command of the 2d Battalion, 1st Infantry, and your battalion is at the head of the main body. You have reached this point and you see that the advance guard has deployed and is firing on the hill you see

yonder, from which a continuous fire is returned. You receive orders here to move with your battalion down this ravine to the vicinity of the lone tree yonder, and from the vicinity of that tree attack the northern end of that hill. Join me on that hill at ten o'clock and show by a sketch the disposition of your battalion during the attack."

When the party assembles again at the designated time and place, the solutions of the various tasks are discussed, the director gives additional information of the movements of the enemy and assigns fresh tasks.

Where different tasks are assigned to each member of the party it is difficult for a director to handle a party of over ten or twelve members. If all are given the same task the party may contain any number; but in this case the work consists of a series of terrain exercises.

It is not advisable to assign a task to a committee of officers. The report of a committee does not necessarily embody the opinions of any member of it, and no one is responsible for them. One of the most valuable results which may be gained from tactical rides consists in training officers to make decisions and assume the responsibility for them; and this training is not gained by committee work. Besides, the deliberations of a committee take up a great deal of time, which might be spent to better advantage in the general discussions or working out new tasks. If the director cannot devise enough tasks to give a separate one to each member of the party, the same task can be assigned to two or more members of the party who are then prohibited from conferring with each other.

One side exercises, possess a great advantage in the fact that general discussions can be held frequently, while in two side exercises there can be no

general discussion till the end. Also the party can be kept better in hand and the exercise can be carried forward more rapidly—which, in tactical rides, is a very important consideration.

One side exercises are not, however, as interesting as two side exercises; and the participants are not so confident that they are getting fair play as they are in the case of two side exercises. An injudicious director can easily spoil the interest in a one side maneuver by always defeating the troops com manded by the officers of his party. These officers will feel that they must take some risks in order to have a chance of winning, and if they notice that they are always pounced upon by superior numbers of the enemy from the direction in which they are the least prepared to meet him, they soon become discouraged and are likely to conclude that the director is taking an unfair advantage of his knowledge of their dispositions.

The members of the party may be required to form decisions and give orders immediately upon having the situation communicated to them and valuable training in troop leading given in this way. When this is done the party need not be dispersed for the detailed study of special problems; all accompany the director, who halts from time to time, informs the party of the changes in the situation and asks their opinions, decisions or orders.

TWO SIDE EXERCISES

In two side exercises the party (which should not number more than twelve for a single director) is divided into two groups, usually designated as Reds and Blues. As stated above, the problem should start the two opposing forces in contact with each other, or be drafted so as to bring them into contact quickly; this can always be done by making one force

the objective of the other and giving the aggressive force information of the whereabouts of the other. The forces should be relatively small or given missions which will restrict their operations to moderate areas.

The director sends one group to a good post of observation in the vicinity of the starting point of their force, and goes himself with the other group to a good post of observation near their starting point, communicates the problem to them, returns to the first group and communicates the problem to them in the same way. The director may assign tasks to all the members of each group or may designate a commander in each and cause the commander to assign the remaining members of their groups to the command of units. These subordinate commanders may be assigned tasks by the director relating to the disposition or handling of their units, or the chief commanders may be given entire freedom in the exercise of command and the subordinates merely required to report the action taken by them pursuant to the orders given by their commanders.

This last form of the exercise is perhaps the simplest and it certainly requires the least preliminary preparation on the part of the director; but as the director cannot forsee the course which the exercise will take, nor be certain in advance of the ground which it will cover, he will have to study the ground after learning the decisions of the commanders before he can carry on the exercise, and this is likely to cause some delay. He may require the commanders to make sketches of the ground covered by the movements which they contemplate, and make decisions based on these sketches; or if he has a detailed topographical map, he may make decisions based on the map; but if the decisions and discussions are not for the most part made with reference to actual

ground. one of the most valuable features of the tactical ride will be lost.

Once the problem is decided on, the remaining steps of the exercise grow out of it.

The succeeding situations should be developed in as natural and plausable a manner as possible; though, of course, the director will not fail to turn the course of events into instructive channels whenever he finds an opportunity to do so. This can be done by tactical decisions on the results of contact, by information of the enemy, by orders from higher authority, etc. For instance, if the director wishes to continue an attack and defense problem with a view to illustrating a withdrawal from an engagement and a pursuit, he may award the superiority of fire to the attack, or he may give the defenders a report that the attacking force is receiving large reinforcements, or he may give the commander of the force on the defensive an order, supposed to be from the next higher commander, directing him to withdraw.

After the tasks have been assigned in both groups, all the officers are directed to re-assemble at a designated locality, preferably one giving a good view of the ground on which the operations are supposed to take place. They may be instructed to report there when their tasks are completed, but it will be generally better to fix in advance an hour for the re-assembly. When the party assembles again, the two groups (Reds and Blues) are kept out of earshot of each other, fifty or sixty yards apart, and partial discussions take place in both groups. Decisions made necessary by the progress of events are then made by the director, each group is given information of the enemy, and fresh tasks are assigned or the commanders are called on for their decisions and orders in view of the changed conditions.

The principal danger to be guarded against consists in letting the party get out of hand. Where commanders are given a degree of initiative in the conduct of operations and are scattered to make the reconnaissances incidental to the solution of their tasks, it is next to impossible, without a pre-arranged rendezvous, to find them all and carry the exercise forward to another stage.

Attempts made to carry on exercises by scattering members of the party about in the positions which their troops are supposed to occupy, maintaining communication with them by visiting them, by mounted orderlies, or by wire, do not result satisfactorily; the officers scattered about get very little idea of what is supposed to be going on, and the exercise progresses slowly.

When it is desired to conclude the exercise, all members of the party are assembled in one group, the problem of each side is explained for the benefit of their opponents, and a general discussion follows.

Several days are sometimes devoted to one problem but it is better to conclude a problem on the day in which it is begun, if possible; for in this way the interest of the party is better sustained and the general discussion takes place before the events discussed are forgotten or confused with others.

DISCUSSIONS ON THE TERRAIN

In a tactical ride a hypothetical situation involving tactical operations is assumed at the outset and the discussions are restricted to the events and situations which grow out of this initial situation. There is a similar form of instruction in which this is not done, commonly called "discussions on the terrain." A party of officers merely rides along any desired route and discusses the adaptability of various features of the terrain for various military purposes.

For instance, on coming to a bridge or a railroad track the modes in which they might be destroyed or rendered temporarily unfit for use could be discussed, or it might be assumed that they had sustained certain injuries and the best modes of repairing or strengthening them might be discussed. Similarly, outpost positions and defensive positions might be selected and computations made of the number of troops that would be required to occupy them properly. Discussions on the terrain may be made very interesting and profitable by an able instructor; but they do not belong to the domain of practical military instruction, and might more properly be classed as lectures illustrated by object lessons.

STAFF RIDES

Tactical rides are sometimes confused with staff rides, although the latter differ from them in the objects sought, in the character of the problems and in the manner in which they are conducted. Staff rides are conducted for the purpose of giving practical experience to general and administrative staff officers in the duties which pertain to their departments. The problems deal with the handling of divisions or larger bodies of troops, and the tasks assigned consist in the preparation of orders, the organization of systems of supply and in general the solution of strategic and administrative problems. As an example of a staff ride, a department commander might require his staff to prepare the orders and submit reports of the arrangements that would be necessary for the concentration of the regular troops and militia organizations in his department. He and his staff might then visit the points decided on for the concentration, the camp grounds might be selected, the officers of the supply departments might be required to report on the arrangements that would be made, to provide the

necessary storehouses, etc., the chief surgeon might report the number, kind and location of the hospitals, the sanitary features of the camps, etc. The troops supposed to have been concentrated might be organized into brigades, and orders might be made out for putting them on the march to meet an imaginary enemy. If the troops have been assembled at more than one point, a strategic concentration might be ordered, the general staff officers might be required to submit plans for a campaign, the questions of transportation and supply might be worked out in detail, and the operations continued as long as may be desired, the department commander acting as director and supplying the information of the imaginary enemy. Two such imaginary forces might be operated against each other, but this would require two directors, one with each party; and these directors must send long telegrams to each other daily in order that each may be able to give out plausible information based on the movements of the other party.

Considerable expense would be incurred by such staff rides, mainly in transportation of officers and the hire of rooms at hotels; and officers would be kept away from their offices for considerable periods. A strategic map maneuver might be conducted which would contain most of the instructive elements of such a staff ride and would avoid these objections. The work done in staff rides is all submitted in writing and most of it is based on a map; while in tactical rides the solutions of tasks are usually oral and the use of maps is reduced to a minimum.

GENERAL REMARKS

In tactical rides an officer is frequently directed to conduct an imaginary patrol or to make a reconnaissance with certain objects in view; but he is only expected to conduct the patrol or make the recon-

naissance in practically the same way that it would be done in a map maneuver; that is to say, he would study the ground, decide on the route to be taken and the methods or dispositions employed, and, at the discussion, describe them to the director; the director then gives him the information of the enemy which the reconnaissance would have secured. It is not necessary that the officer should personally follow precisely the route which he decides on; it is only necessary that he should do so with his "mind's eye"; he may, for instance, ride along a road and select a route for a dismounted patrol covered from the view of the imaginary enemy, up a ravine, through underbrush, creeping through tall grass, etc.

No definite rules can be given for conducting tactical rides and set forms are to be avoided. They may assume a great variety of forms; the forms in any particular case will depend on the instruction which the exercise is intended to convey, and upon the character of the problem selected.

Tactical rides merely constitute one method of giving instruction in tactics. By means of tactical rides almost any desired tactical lesson can be taught. Broadly speaking, an officer can teach in them everything he knows and some things which he does not know. For nearly every discussion elicits some special experience or some special preparation on the part of some member of the party, bearing on the point under discussion; and the discussion may become a clearing house of information which will make it instructive to the director as well as to the other participants.

It is not recommended to substitute tactical rides for field maneuvers when troops are available; but tactical rides constitute a valuable means of supplementing the experience and instruction to be gained from field maneuvers when troops are not available.

For instance, the officers of a small post, garrisoned, let us say, by a battalion, might conduct tactical rides involving the handling of a brigade.

Field maneuvers which have been stopped for some reason before they have reached the culminating point of interest may sometimes be carried a step or two further by assembling the officers and employing the methods of tactical rides, and may thus be made more interesting and instructive.

Sometimes the troops available for field maneuvers are not thought sufficient in number to carry out the exercises desired, and bodies of imaginary troops are attached to one or both of the forces; the imaginary troops can only be handled by the methods of tactical rides. But the mingling of real and imaginary troops has a number of disadvantages and is, as a rule, to be avoided; it is thought preferable to conduct field maneuvers with the troops available; and, if it is desired to instruct officers in the employment of larger or different bodies of troops, to do so by means of tactical rides or map maneuvers.

There seems to be no place for tactical rides at our maneuver camps; the time spent in these camps is so short and the enlisted men so much in need of the instruction to be obtained there that it would seldom be advisable to detach the officers from their commands for this purpose. Tactical rides or tactical walks are, however, well adapted to the purposes of instruction camps of militia officers.

Those who desire a more extended knowledge of tactical rides than can be obtained from these pages are referred to the following works on the subject: "A Tactical Ride" (Von Verdy), "Staff Rides and Regimental Tours" (Haking), "Cavalry Studies" (Haig), "Combined Training" (British Field Service Regulations), "Report of the Maneuvers at Pine Plains, N. Y., in 1908, "Tactical Rides" (Von Litzmann) and "Tactical Rides" (Hoppenstedt).

APPENDIX

FIRE LOSSES*

NOT COMPUTED IN MANEUVERS

Our "Provisional Instructions for Maneuvers" (1904) say (Par. 40): "By practice in calculating losses in war games on the map a certain readiness in recognizing the principal factors governing the effect of fire and consequent facility in estimating losses may be cultivated."

Losses are no longer calculated in war games. The experience of ninety years shows that it is a mistake to do so. The director cannot take the time in a map maneuver to calculate losses by the aid of tables without distroying interest in the maneuver; and map maneuvers are too valuable as a means of instruction in tactics to justify making them unpopular merely for the purpose of training officers to estimate losses well. Besides, the delays caused by such computations prevent the exercises from being carried far enough to enable us to draw conclusions from them.

Tables of losses are not used in field maneuvers. In Colonel Wagner's report of the field maneuvers of 1903 at West Point, Kentucky, and Fort Riley, Kansas, he says: "A table of losses was carefully prepared for the use of the umpires. Such tables, while very valuable in a game of kriegsspiel, are of but little account in maneuvers in the field. * * * In most cases, the action moves so quickly that the umpire is compelled to make his decisions instantly, without time for referring to a table, and the best that can be done is to en-

*The matter in this appendix was printed in pamphlet form nearly a year before the publication of the first edition of this book; this pamphlet was used for a time in the Army Staff College, for lack of anything more suitable, for the purpose of giving student officers who were to act as directors of map maneuvers some training which would serve as a guide in estimating losses from the effect of fire. Before this training was given, the effect of fire was generally overestimated—troops which came under fire in a dense formation were immediately ruled out, etc.; but the solution of a few problems was sufficient to show that such disastrous effects would be produced only when the troops fired on continued to present a favorable target to the troops firing for a commensurate period of time and there was noticeable improvement in the umpiring.

deavor to rectify any mistake that may thus be made when the problem is finally discussed.

It is apparent that the "kriegsspiel" here referred to is the old war game, now distinctively known as "Rigid Kriegsspiel."

The opinion of Colonel Wagner on this subject also appears in paragraph 40 of the "Provisional Instructions for Maneuvers" (1904) as follows: "At maneuvers decisions must be rendered so rapidly that there will seldom be time to make computations or to consult a table of losses."

UTILITY OF TABLES

In the revision of Meckel's "Anleitung zum Kriegsspiel" (1904) the tables of fire losses which appeared in the earlier editions of his work are omitted; in explaining the omission he says:—"The tables of fire losses, given in the first edition of this work, have been omitted here, because their use—as was known then—makes the game slow and tedious. It is believed that there are now officers in each regiment who have sufficient knowledge and good judgment to be able to estimate the effect of fire correctly."

Does any field of usefulness for the old tables of losses—upon which so much labor has been expended—still remain?

It is not doubted that we also have in each regiment officers who are able to estimate the effect of fire correctly enough for the purposes of maneuvers. But while in the German army the younger officers have frequent opportunities—at map maneuvers, tactical rides, and field maneuvers --to learn the probable effect of fire through listening to decisions of older, more experienced and better instructed officers, our opportunities for such instruction have hitherto been limited to our field maneuvers. Many of us have formed exaggerated ideas of the effectiveness of fire arms from our observation of the effects of firing on the target range, and some of the decisions made at field maneuvers do not help to dispel the illusion.

As a result, an unreasonable timidity is sometimes noticed in our younger officers at field maneuvers,--probably greater than they would show in action. A troop commander is sometimes seen to dismount his troop to fight on foot because a hostile patrol has been seen; a company sometimes deploys and halts because it has been fired upon by two or three men.

Instruction in the probable effect of fire in action is highly desirable and our maneuvers (both in the field and on the

map) would be benefitted by it. The chief importance of the losses to the director lies in their indicating the probable conduct of troops which have sustained them; but, aside from the shock action of cavalry, the most important factor influencing the conduct of troops in action is the effect of the enemy's fire on them, and it consequently becomes important to be able to determine this factor with some degree of correctness. If such instruction cannot be obtained in any more satisfactory way,* it is recommended that the tables of fire losses—once used in map maneuvers but now discarded--be revived and used in solving problems based on hypothetical situations, for the purpose of correcting our ideas sufficiently to enable us to estimate losses within the bounds of probability, for the purpose of gaining familiarity with the most important factors which influence the effect of fire.

BASIS OF TABLE

The table attached is based on paragraph 40 of the "Provisional Instructions for Maneuvers" (1904); which appears to be based on the tables of "The American Kriegsspiel" (Livermore). The use of percentages of losses is discarded because it has been found by an extended series of tests that it is simpler in most cases to compute the number of men who will probably be disabled than to compute the percentage of the organization. It is true that the percentage is really the more significant number,—especially when taken in connection with the rough rule given in paragraph 28, "Provisional Instructions," that a loss of one third is a sufficient ground for ruling an organization out; but when the number of men disabled is determined, the percentage of loss is also known or can be readily computed.

Paragraph 40, "Provisional Instructions," has also been departed from to some extent in regard to the effect of artillery fire; the allowance at 3000 yards appeared to be insufficient in view of recent experiments, and the allowance at 1000 yards appeared to be too great; and the figures have been modified accordingly. It is hoped that data can be obtained by means of which the table can be tested and corrected to accord more perfectly with recent experience both ni regard to rifle and artillery fire. Officers who use the table are recommended to depart from the weights given the var-

*Officers are recommended to study the works of Lieut. General H. Rohne on "Infantry firing regulations", and "The effect of infantry fire under service conditions", also "The Rifle in War" by Captain H. E. Eames, Pars. 171-188," Small Arms Firing Manual" (1906), and Pars. 17-20, "Proposed Regulations for Field Maneuvers"

ious factors in the table whenever they can approximate more closely to actual conditions by doing so.

USE OF TABLE

To use the table in determining the probable effect of rifle fire, the mind is fixed upon the losses which will probably occur in the case of one company of 128 men—deployed and fired on by another company of equal strength—for one minute.

Certain circumstances in regard to the troops causing the loss are always taken into consideration,—such as the range, rapidity of fire, position taken in firing, degree of instruction and physical condition, and their morale and the effect of hostile fire upon them. Circumstances relating to the troops fired on are also considered, such as the angle which their front presents to the line of fire, whether they are in motion or at rest, their formation or interval, their position (standing, kneeling or lying), and whether or not they are under cover.

But the circumstances just named are shown in the table and it is unnecessary to burden the mind with them at the outset, though the object of using the table is to familiarize ourselves with these circumstances and their relative importance.

What is called the "standard case" is shown in the center column of the table; and, expressed in ordinary language, its meaning is as follows:—that if a company (128 men) fires one minute on another company (128 men—who return the fire) a loss will be inflicted on the second company of one man; corresponding to 0 points (to be explained later); when the range is 900 yards; the first company fires six shots per man per minute; from a lying position; their instruction is average (fair); their condition is fresh (not fatigued); their morale is unshaken (good); they are sustaining a fire equal to their own: and the front of the second company makes an angle of 90° with a line through the centers of the two companies, the second company is not in motion, is deployed with two paces interval between the men, and the men are lying down in the open without cover. The range is supposed not to be accurately known by the troops firing but to be estimated with ordinary skill.

Circumstances which vary from the "standard case" are shown in other columns of the table and it will be noticed that circumstances which have the effect of increasing the rate of loss are placed in columns to the right of the center;

while those which diminish the rate of loss are in the columns to the left.

The losses in cases which vary from the standard case are obtained by multiplying the loss in the standard case by a suitable multiplier (or combination of multipliers) placed in the table at the top of each column and it will be observed that the multipliers greater than unity are placed in the columns to the right of the center while multipliers less than unity are in the columns to the left.

Since the processes of multiplication become tedious when the varying circumstances are numerous, modified logarithms or "points" are used instead of the multipliers themselves, in order to abridge the work of computation. When the multipliers are greater than unity, the "points" which correspond to them are added, consequently the "points" in the columns to the right of the center have the + (plus) sign; when the multipliers are less than unity the corresponding points, in the columns to the left of the center, have the — (minus) sign.

These "points" are obtained by taking the common logarithms of the numbers immediately above them (the corresponding multipliers), multiplying them by 20, and rejecting the fractions. It is apparent that these "points" are not accurate, but they are sufficiently so for our present purposes.

The assumption is made that if the company, the effect of whose fire we are considering,—mentioned in the description of the "standard case", and which for the purpose of discussion we will call Blue,—is reinforced by another Blue company the losses of the enemy (Red) per minute will be doubled.

If the Red company is reinforced by another, which merely thickens without extending the line, it is assumed that the rate of the loss of the Reds will be doubled. (This is shown in the table by the column "Troops Fired On"—Formation—1 man per yard—Multiplier 2).

But if the second Red company prolongs the line of the first without thickening it, the assumption is that the rate of the Red loss is not changed.

Of course the moral factor is affected by reinforcements, as is shown by another part of the table, but this element is left out of consideration for the present. The length of the target should, however, be taken into consideration when it is less than $\frac{1}{10}$ of the range. In such cases it is supposed that a considerable portion of the bullets fall to the right and left of the target and a suitable diminution should be made in the

estimated loss, varying directly with the range and inversely as the length of the target. This diminution is not shown by the table.

PROBLEMS

The use of the table can be shown most readily by means of examples. In those which follow, the conditions of the standard case are assumed to exist except when the contrary is stated.

Problem No. 1. Six companies (Blue) fire two minutes on four companies (Red) on the crest of a hill, which return the fire,—distance 700 yards. The Blue force marched at double time five minutes immediately before opening fire. Required, —the losses on both sides.

Solution. The disparity of force (3 to 2) is not sufficient to affect the morale of either side appreciably,—especially as the stronger force is fatigued.

The losses of the Blues are caused by the fire of four Red companies, consequently the normal loss (one man) must be multiplied by 4 (corresponding to + 12 points); the fire is sustained two minutes, consequently it must be multiplied by 2 (corresponding to+6 points); and the range being 700 yards, it must be multiplied by 1.6 (corresponding to +4 points). The Blue loss then will be $1\times4\times2\times1.6=12.8$. The Red loss may be computed in a similar manner ($1\times6\times2\times1.6\times.6\times.4=4.628$).

The solution by making use of the points is easier because we add instead of multiplying and we then have no fractions to deal with. It as as follows:

BLUE LOSS		RED LOSS	
4 Red cos.	+12	6 Blue cos.	+16
2 minutes	+ 6	2 minutes	+ 6
700 yards	+ 4	700 yards	+ 4
		Fatigued	—4
Total	+22	Crest	—8
Ans. 12 men		Total	+26—12=+14
			Ans. 5 men

If the multiplier which we wish to use is not found at the top of the table, search is made for it in the line below the table. To interpret the meaning of the results (+22 and +14) search is made for these numbers in the second and in the last lines of the table, and the corresponding multipliers (12 and 5) are used to multiply the loss in the standard case (one man).

Problem No. 2. Three platoons of dismounted cavalry (Blue) advance by rushes over open ground from 700 to 500 yards' distance against two platoons of dismounted Red cavalry firing at them from the edge of a wood—time consumed ten minutes. The Blue line of fire is at an angle of 60° with the front of the Red position. What are the losses on both sides?

Solution. A platoon of cavalry dismounted (eighteen men) is roughly one-seventh of a company (128 men). The Blue force is taken at three-sevenths of a company and the Red force at two-sevenths of a company. The morale factor is inappreciable.

BLUE LOSS		RED LOSS	
$\frac{2}{7}$ Red Co.	+6—17=—11	$\frac{3}{7}$ Blue Co.	+10—17=—7
10 minutes	+20	10 minutes	+20
600 yards	+6	600 yards	+6
		60°	+2
Total,	+26—11=+15	Wood	—6
Ans. $5\frac{1}{2}$ (say 6) men		Total	+28—13=+15
		Ans. 6 men	

When a number is used as a divisor (as 7 is used in this case) look for the points corresponding to it and then use them with a negative sign.

Problem No. 3. A company of Blue infantry in trenches is fired on ten minutes by two companies of Red Infantry at 600 yards' range, and during the same time is enfiladed at 30° by a squad of (eight) sharpshooters at 700 yards' range. The Blue company returns the fire of the two Red companies, which are in front of it; but the sharpshooters are not seen and do not attract fire. What is the loss of the Blue company?

Solution.

FIRE OF TWO RED COS.		FIRE OF SHARPSHOOTERS	
2 cos.	+6	Squad $\frac{1}{16}$ co.	—24
600 yards	+6	Sharpshooters	+6
10 minutes	+20	Under no fire	+4
Trench	—12	700 yards	+4
		10 minutes	+20
Total	+32 —12=+20	Angle 30°	+6
10 men		Trench	—12
		Total	+40 - 36=+4
Ans. 10+2=12 men.		1.6 (say 2) men.	

Problem No. 4. A Blue company advances by rushes in skirmish line over open ground in thirty minutes from 1,000 yards to 700 yards of thirty dismounted Red

cavalrymen firing on them from the crest of a hill. What is the loss of each?

Solution. It is assumed that one section of the Blue company advances at a time and that three sections are returning the fire of the Reds.

BLUE LOSS

$\frac{30}{128}=\frac{1}{4}$ (about)	—12
30 minutes	+30
Cav. under fire 3 times	—5
	+30—17=+13.
	Ans. 4.5 (say 5) men.

RED LOSS

$\frac{3}{4}$ co.	+10—12
30 minutes	+30
Crest	—8
Inf. under less than equal fire	+2
	+42—20=+22. Ans. 12 men.

It is apparent that the Reds will be driven from the hill. The decisive factor here is the superiority of fire of the Blue infantry. The effectiveness of the fire of the Reds is diminished (—5) by the fact that they are under a fire three times as heavy as their own, while the effectiveness of the fire of the Blues is increased (+2) by the fact that the fire directed upon them is less than their own.

Problem No. 5. A troop of Blue cavalry charges as foragers from cover at 600 yards a company of Red infantry which is deployed and firing. Does the charge succeed?

Solution. It depends on the morale of the infantry; if the infantry is surprised the loss of the cavalry will be as follows:

300 yards (average)	+12
Rapid fire	+ 4
Cav. skirmishers	+18
Motion charge	—6
Inf. surprised	—6
	+34—12=+22. Ans. 12 men.

But if the infantry is unshaken, the loss of the cavalry is:

300 yards	+12
Rapid fire	+ 4
Cav. skirmishers	+18
Motion charge	—6
Inf. under no fire	+ 4
	+38—6=+32. Ans. 40 men.

In the first case the charge would probably succeed; in the latter it would probably fail.

Problem No. 6. A Blue company which has marched at double time for three minutes up a slope of five degrees in close order and immediately deployed in skirmish line (two paces interval) in the edge of a wood is, to its surprise, fired on by a Red company in a trench 400 yards in its front, deployed at one man per yard. Both companies open rapid fire. What are the losses at the end of one minute?

Solution.

BLUE		RED	
Red co. rest (trench)	+ 2	Fatigued	— 6
Rapid fire	+ 4	Surprised	— 4
400 yards	+10	Trench	—12
Wood	—6	400 yards	+10
		Rapid fire	+4
		1 man per yard	+6
Total +16—6=+10			
Ans. 3 men.		Total+20	22=—2
		Ans. .8 (say 1) man	

The fatigue factor is changed from —4 as given in the table to —6 because it is thought that the marching at double time up a steep slope would have a very exhausting effect; similarly the surprise factor is changed from that given in the table because it is thought that the cover of the wood prevents any considerable confusion as the result of the unexpected fire. Factors should be used in accordance with the circumstances of the case; the table is merely a guide. Note that the negative sign of the result (—2) merely means that the multiplier is a fraction.

ARTILLERY AND MACHINE GUNS

The fire of a machine gun is taken to be equal to that of a platoon (sixty-four men). In computing the effect of artillery fire, the case is considered of a battery of four guns, not under effective fire, using direct fire, and firing on a company (128 men) range approximately determined.

The figures given are based on the supposition that the fire of a battery at 3,000 yards is about equal to that of a company (128 men) at 1,000 yards; and that the effectiveness of the battery does not increase rapidly at shorter ranges.

The factor of vulnerability of artillery in action (10) is based on the supposition that the guns have no shields and that no other cover has been provided. In the case of ar-

tillery in action protected by shields, the multiplier for "trench" (.25) should be introduced; but if the fire is at an angle of 60° or less with the front of the battery the protection of the shields is not considered.

Problem No. 7. A battery of field artillery (Red) not under effective fire and using direct fire with range approximately determined fires one minute on a battalion of Blue infantry lying in the open at 2500 yards. Required, the loss of the Blue infantry.

Solution. The only circumstance here varying from the standard is that a battalion (4 cos.) is fired on. But since nothing is said about the formation or interval, it is presumed that the battalion is in one line with the standard interval (2 paces). Increasing the length of the target is not supposed to increase the rate of loss above the standard; though shortening the target to less than $\frac{1}{10}$ of the range would lower the rate below the standard.

The loss of the Blue infantry is estimated to be one man.

Problem No. 8. A battery fires for four minutes on two companies on the crest of a hill. The companies are deployed one man per yard and the range is 3500 yards. What is the loss of the infantry?

Solution. The length of the target is $\frac{1}{14}$ of the range and an estimated allowance of four points is made for bullets falling to the right and left of it.

4 minutes,	+12	
Crest,		—8
3500 yards,		—6
1 man per yard,	+ 6	
Target $\frac{1}{14}$ range,		—4
Total,	+18	—18=0, Ans. 1 man.

Problem No. 9. A battalion of infantry leaves cover and advances in line in double rank over open ground from 2100 to 2000 yards range of a hostile battery which has previously ascertained the range approximately. The infantry advances without halting or firing. The ground is of such a nature that they can march only fifty yards per minute. The battery opens fire upon them as soon as they appear. What are the losses of the infantry?

Solution. No allowance is made for the motion of the infantry—it would be less than one point and make no appreciable difference in the result.

2000 yards	+ 2
2 minutes	+ 6
2 ranks	+16
Standing	+16
Total:	+40, Ans. 100 men

It sometimes happens that results are obtained which are not found among the "points" given in the table. It is to be remembered that these "points" are used as logarithms. A result in points not in the table can be distributed among numbers found in the list of points, and the multipliers corresponding to these numbers multiplied together.

For example, suppose that we have obtained a result of +72; this is not in the table but it can be distributed as + 40+32.

+ 40+32= +72
100×40=4000

That is to say, +72 points correspond to the multiplier 4000.

The "points" are only approximate logarithms; when the results are large the error is sometimes considerable. To show their inaccuracy, suppose a result of +60 is obtained. If this result is distributed as +40+20 or as +20+20+20 the final multiplier is found to be 1000; but if it is distributed as +30+30 a multiplier 900 is obtained.

Losses

Mult	4.00	6.00	8.00	10.00	16.00	20.00
Poin	+12	+16	+18	+20	+24	+26
TROOPS FIRING — RANGE yards — F						
TROOPS FIRING — RANGE yards — E	300	200		100		
TROOPS FIRING — Rate						
TROOPS FIRING — Posi						
TROOPS FIRING — Inst						
TROOPS FIRING — Physic						
TROOPS FIRING — Mor						
TROOPS FIRING — Und						
Troops Fired on — Angle						
Troops Fired on — Mot						
Troops Fired on — For		2 Ranks	Cavalry skirmishers	*Artillery in action	Cavalry in line	Artillery limbering
Troops Fired on — Pos		Standing				

*Unsheltered

Additional Multi	9	11	12	13	18	24	30	40	100
Corresponding P	19	+21	+22	+23	+25	+28	+30	+32	+40

Table of Multipliers for use in Computing Fire Losses

Multipliers		.05	.1 0	.12	.16	.20	.25	.30	.40	.50	.60	.80	1.00	1.20	1.60	2.00	2.40	3.00	4.00	6.00	8.00	10.00	16.00	20.00
Points		−26	−20	−18	−16	−14	−12	−10	−8	−6	−4	−2	0	+2	+4	+6	+8	+10	+12	+16	+18	+20	+24	+26
TROOPS FIRING	RANGE yards — Field Artillery						4000			3500	3300	3000	2500	2000	1500	1000									
	RANGE yards — Rifle			1800	1700	1600	1500	1400	1300	1200	1100	1000	900	800	700	600	500	400	300	200		100		
	Rate of Fire												6 per min.		Rapid									
	Position											Standing	Lying	Rest										
	Instruction									Recruits			Average			Sharpsh'trs								
	Physical Condition										Fatigued		Fresh											
	Morale									Surprised		Shaken	Unshaken											
	Under Fire									4 Times	Double		Equal		None									
Troops Fired on	Angle of front												90°	60°	45°	30°								
	Motion						Gallop oblique			Trot or D. T. oblique	Gallop to front	Trot or D T. to front	0											
	Formation						5 yards interval				2 yards interval		2 paces interval			1 man per yard		1 Rank		2 Ranks	Cavalry skirmishers	*Artillery in action	Cavalry in line	Artillery limbering
	Positon	Loopholes					Trench		Crest	Wood			Lying			Kneeling				Standing				

*Unsheltered

Additional Multipliers	.06	.11	.14	.18	.22	.27	.35	.45	.55	.70	.90	1.1	1.4	1.8	2.2	2.7	3.5	4.5	5	5.5	7	9	11	12	13	18	24	30	40	100
Corresponding Points	−24	−19	−17	−15	−13	−11	−9	−7	−5	−3	−1	+1	+3	+5	+7	+9	+11	+13	+14	+15	+17	+19	+21	+22	+23	+25	+28	+30	+32	+40

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